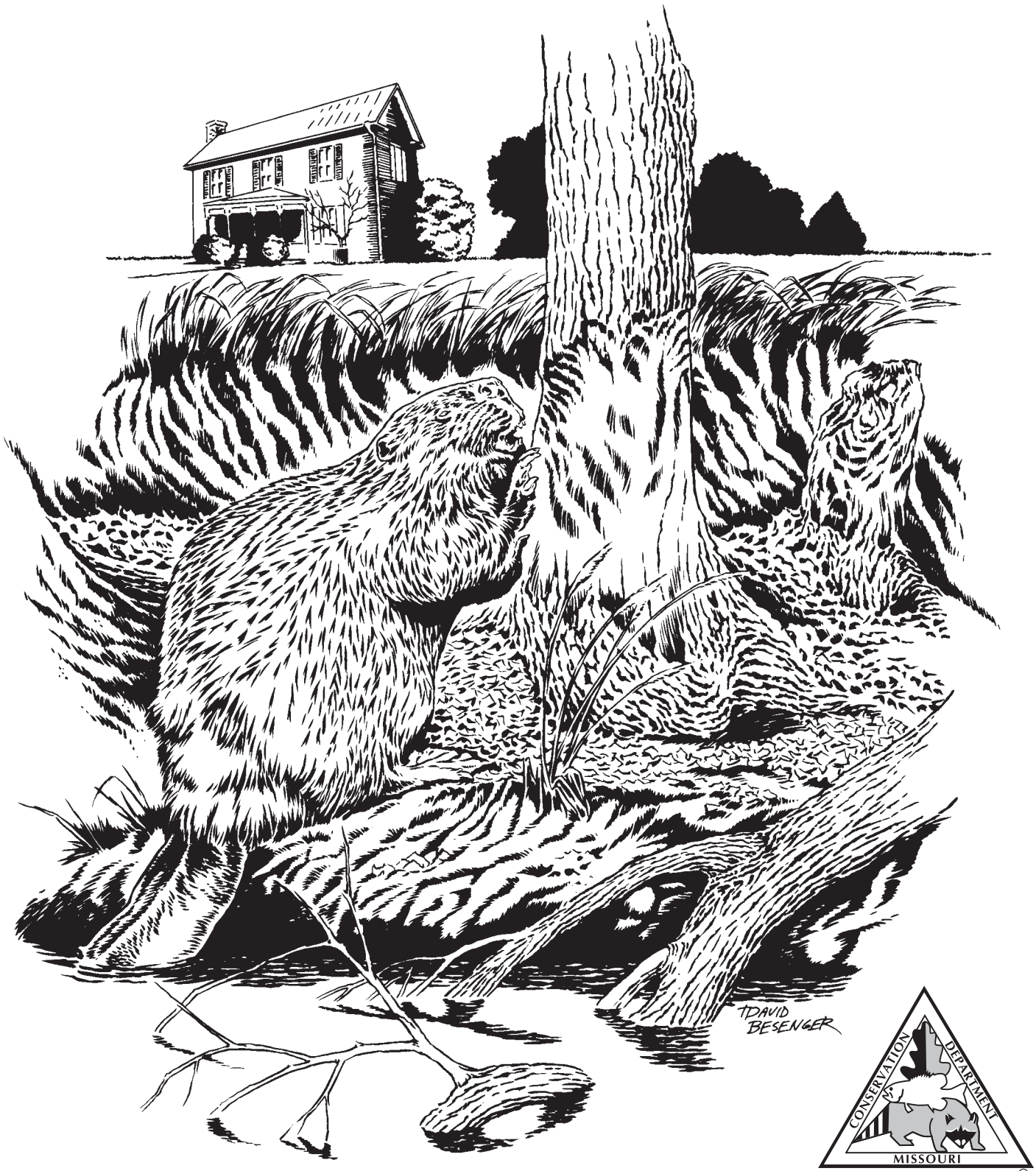
Missouri's Beaver

A Guide to Management, Nuisance Prevention and Damage Control



CONSERVATION DEPARTMENT
MISSOURI
®

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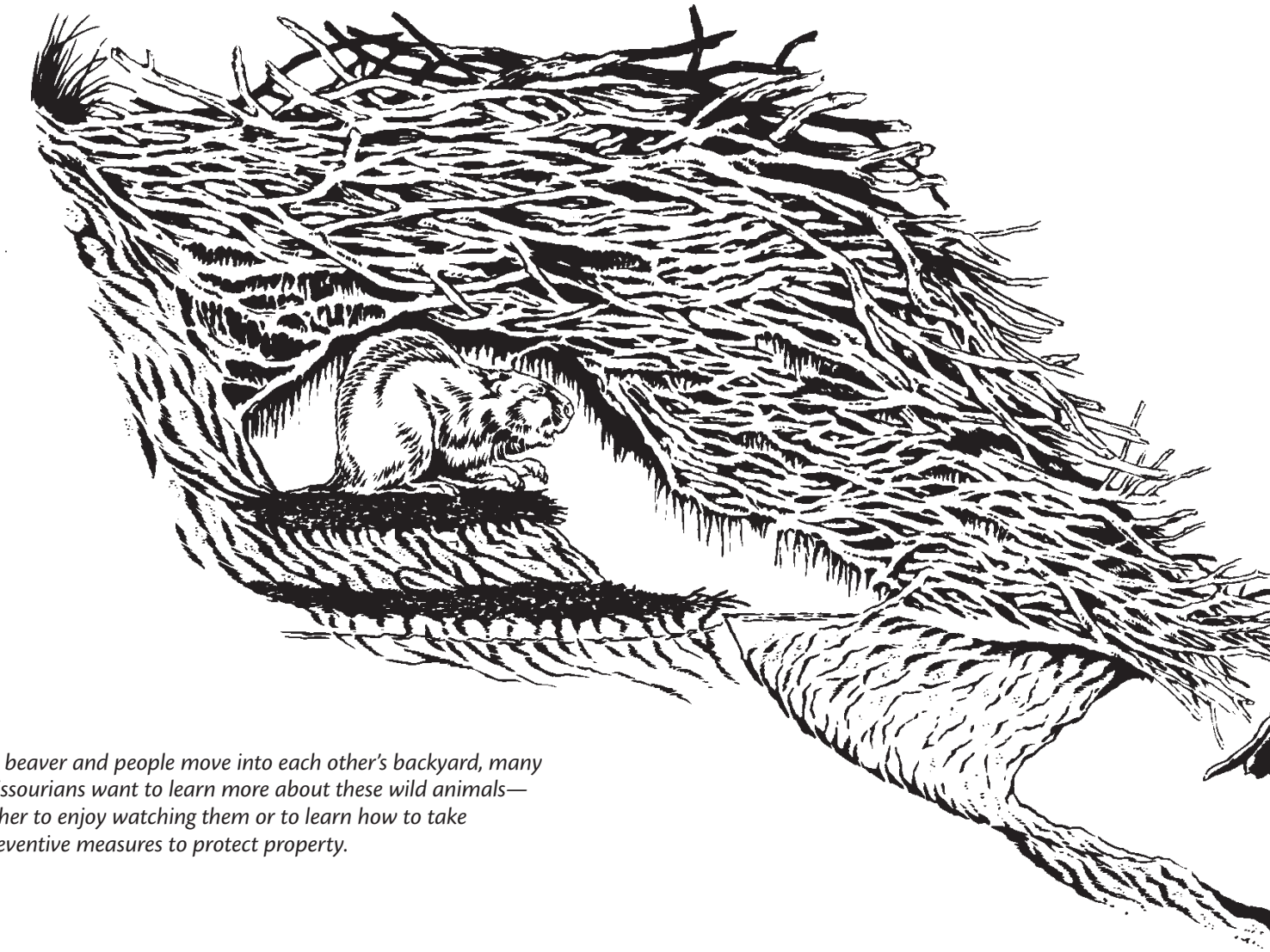
INTRODUCTION TO MISSOURI'S BEAVER

Beaver, more than any other animals besides humans, alter the environment to meet their needs. The dams they build in streams, the trees they cut for food and the channels they dig to increase their mobility in the water bring diversity in plant and animal life to the area. Now that beaver populations are again thriving throughout Missouri and the United States, more people are coming into contact with the alterations that these animals make on the landscape.

As their populations increase, beaver are no longer only associated with wild, remote wilderness areas. They are abundant all over Missouri wherever suitable habitat is found. Beaver are present in most streams that have a year-round water flow, in farm ponds, in city and private lakes and in large bodies of water. Increasingly, beaver are becoming more common in urban areas.

The contacts with these industrious rodents result in a variety of attitudes. A farmer with a small stream on the land may benefit from a beaver dam that stores much needed water during a drought. Another farmer may have a serious problem when beaver dams flood bottomland crops. To one urban dweller living in a lake-front home, beaver may be something to be enjoyed and protected. A neighbor may be losing ornamental trees on his lawn and, as a result, have an entirely different view point. Often landowners' attitudes change from wanting to protect beaver when the animals are not causing problems to wanting them destroyed when property is being damaged.

As beaver and people move into each other's backyard, many Missourians want to learn more about these wild animals—either to enjoy watching them or to learn how to take preventive measures to protect property. This booklet is a guide to both understanding these semi-aquatic animals and how to avoid nuisance beaver problems.



As beaver and people move into each other's backyard, many Missourians want to learn more about these wild animals—either to enjoy watching them or to learn how to take preventive measures to protect property.

ROLE IN MISSOURI HISTORY

Abundant when Europeans first arrived, beaver played an important role in the early settlement of Missouri. In the 1700s the French came in search of fine beaver pelts and other furs that were popular in Europe. Old dugout canoes, called pirogues, have been unearthed along streams in Missouri in recent years as evidence of those early French beaver trappers. One of these historic boats was found along the Thompson Fork River in Grundy County and another in the Kansas City area at the confluence of the Blue and Missouri rivers.

Much of the purpose for Meriwether Lewis' and William Clark's famous Missouri River expedition from 1804 to 1806 was to explore the area's potential for the fur trade. Not only did the two adventurers write about fur traders they met as they traveled up the Missouri River, but at night their own men set traps, which often supplied beaver meat for the expedition. After the trip, Clark returned up the Missouri River to establish Fort Osage, a fur trade outpost near what is now Kansas City.

Missouri played a key role in the early fur trade. Many trading companies had headquarters in St. Louis, once known as the world fur trading center. The businesses sent trappers further into the wilderness to find more furs. As a result, these adventurers and the companies that sponsored them helped open up the Western frontier in the late 1700s and early 1800s.

One famous St. Louis fur trader, Joseph Roubidoux III, set up a trading post at the mouth of Blacksnake Creek on the banks of the Missouri River in what is now St. Joseph, the city he later founded and named after his patron saint. There, he traded with trappers and Native Americans for beaver pelts and other furs.

The journals of Lewis and Clark also noted the city of St. Charles as a fur town, where most of its inhabitants were employed in the fur trade.

In the 1830s, mountain men traveled through Missouri on their way west after beaver pelts. "Kit" Carson was a native Missourian who joined their ranks. Another famous explorer, Daniel Boone, after he migrated to Missouri from Kentucky in 1799, went up the Grand River one winter on a beaver trapping expedition accompanied by a young servant. The two found themselves surrounded by American Indians and were forced to break camp and beat a hasty retreat.

Fashion fueled the lucrative beaver fur market that enticed men to make journeys into uncharted territory. Men's hats, made from the finest beaver pelts, were the rage throughout Europe during the early 1800s. The dense, almost down-like underfur was used to make the best quality felt for hats. The higher the percentage of beaver fur, the more expensive the hat.

But fashion is fickle, as the trappers and traders soon found out. The discovery of the silk worm brought about a new popular style of hats, which caused the beaver fur market to plummet by the end of the 1830s.

Even with a lower demand, trapping continued in the United States. Intensive unregulated trapping caused the number of beaver to steadily decline until they were considered extirpated from Missouri by 1929. Beaver trapping was prohibited in Missouri from 1929 to 1953.

As soon as they were protected, beaver began repopulating the state. Animals from upstream began colonizing the Missouri River and its tributaries in north Missouri. In southern Missouri, six purchased pairs were released in 1928 and 1929. Beaver from the west are thought to have repopulated the southwestern part of the state.

Although special farmer-damage trapping permits were allowed as early as 1945, the first modern beaver trapping season didn't begin until 1953.

The first season lasted 15 days in only 76 of the 114 counties. Gradually the season was lengthened and expanded to include more counties. In 1956, a 46-day season opened statewide. The market for beaver pelts at that time was low, and the beaver population continued to increase.

Beaver pelt prices have remained relatively low through the years. Although trappers continue to take beaver, harvest pressure has not been adequate to control population growth.

As a result, the current beaver trapping season remains liberal. In the mid 1990s, beaver have become plentiful, not only in Missouri, but all across the North American continent where suitable habitat is found.

Physical characteristics

More at home in the water, beaver get out on dry land to cut trees and other vegetation for food and occasionally to travel short distances overland from one water habitat to another. Special characteristics enable this semi-aquatic animal to adapt to both environments.

Perhaps the most commonly recognized feature is the beaver's broad flat, scaly tail, which the animal uses for stability while sitting and feeding or while chewing its way through a tree. In the water, it serves as a warning device when an alarmed beaver slaps it on the surface of the water. When swimming, the beaver uses its tail as a rudder.

The front feet are equipped with heavy toenails for digging bank dens, dredging up mud from the stream bottom for dam building, digging channels, and for handling food and construction material.

The large webbed hind feet are used to propel the animal through the water. The three outer toes on the hind feet have typical claws, but the fourth toe has a split or double toenail that beaver use as a comb to rid their fur of lice and to distribute oil from the oil sacs to help waterproof their fur.

Other specializations have helped the beaver adapt to their aquatic way of life. The location of the eyes near the top of the head allows beaver to see above the water while keeping most of their body submerged. Although their vision is only fair above water, beaver see much better when submerged. A membrane closes over the beavers' eyes to protect them when underwater. Both the ears and nose have valves that close when the beaver submerges. As an aid in gnawing underwater, the lips meet behind the incisor teeth, which prevent water from entering the mouth.

Beaver can regulate their blood chemistry, heart rate and circulation patterns so they can work underwater for up to 15 minutes. When held underwater, beaver do not drown as most mammals do. Instead, they remain calm until they realize they are in trouble. At that point, the beaver will frantically try to surface and, if unable to do so, will die in about a minute from a condition called narcosis or carbon dioxide poisoning. Most other warm-blooded animals will die in three minutes from what is called "wet" drowning. This means that unlike beaver, they inhale water into their lungs and die from lack of oxygen.

Missouri's largest rodent, an adult beaver averages between 30 to 50 pounds, but trappers on occasion catch ones that weigh more than 100 pounds. Beaver, like most rodents, have front teeth that grow continually throughout their lifetime. The back side of their four orange incisors wears away, and the harder front surface remains. This forms a beveled edge that the beaver sharpens by gnawing. Beaver use these opposed pairs of chisels to cut trees of most any diameter. These sharp teeth also are used to remove the trees' outer dead bark and to cut loose the cambium—the inner growing layer of the tree that beaver use as a principle food source during the winter months.

Beaver vary in color from a light to a dark brown. The darker-colored beaver are more prevalent in central and southern Missouri, while the lighter ones occur in the north and northwest. In the fur trade, the lighter shades—referred to as "pales," "blondes" and "silvers"—are more in demand. Beaver with black fur rarely occur in Missouri. No matter what color, all beaver have a dense underfur that traps air and protects them from cold water in the winter. It is this underfur that is so highly prized in the fur industry.

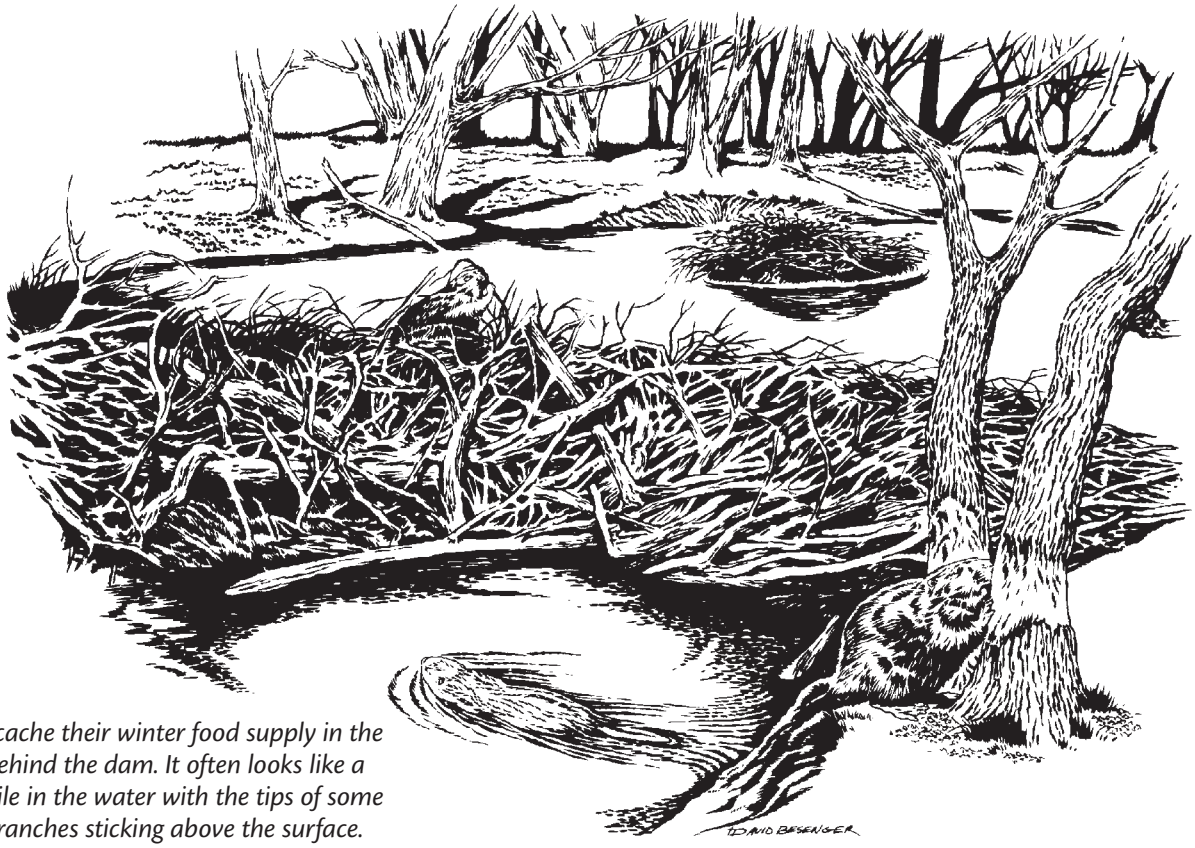
Male and female beaver are difficult to identify without a physical examination. Both sexes have one opening—called the cloacal—that is used by the reproductive and excretory systems. The male's penis is hidden inside this opening. Sometimes it is possible to observe the two pairs of teats on a female when the animal is in the late stages of pregnancy or is nursing.

Beaver deposit castor, the scented oil from their castor glands, on a small mound of mud and leaves that the beaver places near the water's edge.

Social structure

Beaver are social animals. They usually live in family units, called colonies, that consist of an adult pair and the young from that year. The male parent stays in the area although the female may keep him at a distance when the young are small.

Beaver in Missouri usually breed in February, and the young are born in late April or early May. Occasionally some females breed later in the year, but they still have only one litter a year. A young female beaver may have two or three young—called kits—in its first litter. Older females produce larger litters. Even though beaver only have four teats, they may have as many as



Beaver cache their winter food supply in the water behind the dam. It often looks like a brush pile in the water with the tips of some of the branches sticking above the surface.

seven young—and on rare occasions eight or more. The average litter size, however, is three or four.

Yearling beaver may naturally disperse on their own in early spring or be driven out of the colony when their parents have a new litter. A mated pair of young beaver may move into suitable habitat and establish territory during the summer of their second year. Much like young Canada geese, this first year in the chosen new territory is the "honeymoon" year, the time before the pair has its first litter. Occasionally a solitary beaver, which trappers refer to as a "bachelor," may set up a territory by itself.

During mating season, many beaver—especially in areas of higher populations—show fresh bite marks. This is attributed to rivalry among adult males, defending territory, or the result of adults driving off last year's young. Adult beaver of both sexes often show scars from bites received throughout their lives. Most beaver survive these battles, but the scars indicate that sometimes the wounds are severe.

Beaver usually mate for life. They establish their territory during the spring, and the female is especially protective of the home territory during the summer while the kits are small. Both parents are persistent in maintaining their dam or plugging tubes in ponds, to maintain maximum water depth to keep their young safe.

Beaver in Missouri have few natural predators. Coyotes, bobcats, dogs and great horned owls may occasionally catch and kill young beaver when they are on land. Recently, river otter have been suspected of killing young beaver. However, people are the only significant predators.

Male and female beaver produce a scented oil from their castor glands that is used to mark territory and to attract mates. The castor is deposited on a small mound of mud and leaves that beaver haul out of the stream or lake. Along most streams these castor mounds are soon washed away, but on lake banks that seldom flood the castor mounds may build up over the years into conical mounds several inches high. Although beaver make castor mounds throughout the year, there is a period of increased castor mounding activity from January through March and especially after the ice melts off the streams and the beaver become more active.

Although usually nocturnal, beaver are more likely to be active during daylight hours in late winter and early spring during the mating season. They also can be seen during the day soon after the ice has thawed and when young beaver are dispersing. Beaver also may be seen in the early mornings or late evenings, particularly if they have become used to humans.

Feeding habits

Beaver seem to be totally herbivorous. They are sometimes accused of eating fish, especially if remains of fish are found at a beaver colony.

However, there is no recorded proof of beaver eating fish. Otter, mink and raccoons living in the same habitat are likely responsible.

In Missouri, silver maple, willow and cottonwood bark are the beavers' preferred winter food. When these foods are not available, beaver can make do with hardwoods, such as ash, oak, hickory and walnut. Beaver that feed on the bark of hardwoods for an extended period are poorly nourished and have little fat reserve compared to those feeding on the softer maples, willows and cottonwood.

Ornamental trees such as poplar and weeping willow, as well as apple and other fruit trees, also appeal to beaver. These preferences often cause conflicts with people. See how to protect these trees on Page 12.

In spring and summer beaver seem to depend less upon tree bark for food and turn to aquatic plants and tender green shoots of terrestrial plants, such as giant ragweed, pigweed, sunflower, smartweed, cattail, bulrushes, sedges, corn and soybeans that grow along the edge of the pond or stream banks.

Beaver eat green corn and sometimes use the stalks for dam maintenance. Corn fields bordering beaver colonies often have well worn trails over which the beaver drag the corn stalks into the water. This type of nonwoody vegetation is estimated to constitute three-fifths of the beavers' annual food.

Storing food

A flurry of beaver activity takes place in late October and early November as the colony prepares for winter. Dams are built up and kept in good repair, saplings and trees are cut, and the winter food supply is laid in. As winter approaches, beaver build their food cache or feed bed. After a tree is felled, the branches are cut to suitable lengths of 2 to 4 feet and floated to the feed bed located near the winter lodge or bank dens. This food storage area often looks like a brush pile in the water with the tips of the branches sticking above the surface.

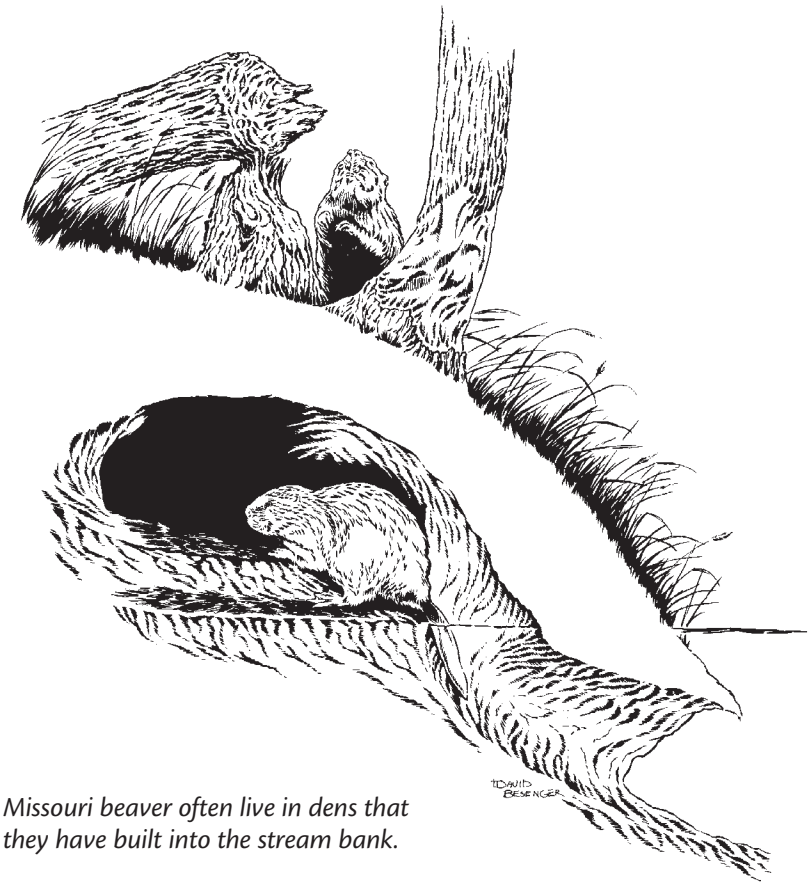
Feed beds usually are present near a wintering active colony, but fall flooding may wash out the food supply. Missouri winters, even in the northern part of the state, are relatively mild. Streams and ponds are seldom ice covered for long periods of time, allowing beaver to survive despite the loss of their food cache. In fast moving streams or ones with many springs, beaver may not store food for winter and may rely exclusively on food they obtain from the shore. Feeding in this fashion is more common in extreme southern Missouri, where spring fed streams and normal winter temperatures remain high enough to permit an ice-free flow all year.

Tree girdling

Sometimes beaver partially or completely girdle cottonwood, oak or other large trees that grow along the stream or lake bank. Beaver do not seem to be trying to cut the tree or to obtain food when they do this. Often the girdling will be on the lower side of the tree next to the water. One theory is that beaver gnaw to maintain wear on their teeth. Gnawing wears away the ends of the ever-growing incisor teeth that otherwise would grow into the lower jaw, block the mouth, and cause the beaver to starve. The "gnaw trees" are often in areas where castor mounds are found and, therefore, may have some territorial significance.

Lodges and dens

Beaver in Missouri often select a high bank or take advantage of the earth-holding roots under a tree to dig a den. The entrance may be from a few inches to several feet below the water's surface. Beaver usually have at least two or three entrances to their bank dens or lodges. Only when banks are too low to permit the digging of dens do beaver build lodges of sticks and mud out in the middle of the pond.



Missouri beaver often live in dens that they have built into the stream bank.

Inside the bank den, a foot or two above the water level, a living chamber is hollowed out large enough for the beaver to feed, sleep and move about. The floor of the chamber is covered with shredded wood that prevents puddles of water from forming on the chamber floor when beaver swim into the den. Sometimes the digging of the hollowed chamber results in a cave-in of the bank. Beaver thatch over these holes with mud and sticks. These mounds, referred to as bank lodges, often extend down over the bank. In winter the well-maintained mud-and-stick thatch freezes solid and keeps the beaver warm and predators out.

In winter, the beaver can swim out of the lodge to the feed bed even when the pond is ice covered. They may chew off a stick that is interwoven in the underwater storage area and bring it back into the lodge to feed on the bark. Ice may cover the stream or beaver pond for weeks, but the beaver still have access to their food source under the ice. Strings of bubbles and discarded peeled sticks and droppings under the ice indicate the lodge's entrance. The ice is usually thinner right above the entrance to the lodge or bank dens because of the activity of the beaver swimming in and out.

Besides the main lodge near the winter feed bed, an established beaver colony may have several dens along the banks in the same area. These bank dens are sometimes difficult to detect. Some members of the colony may live in these extra dens or use them as dining areas.

Bank dens often collapse when flooded, which may happen several times a year. Usually beaver abandon these caved in bank dens and dig new ones. After the beaver move out, raccoons, mink, muskrats and otters may move in.

Dam building

People have long marveled at the dam building ingenuity of "nature's engineers." The purpose of the dam is to add more depth to a stream, which allows beaver more room for swimming, moving sticks through the water and for storing their winter food supply. By regulating the water's depth, beaver can protect the entrance to their bank dens. Beaver dams and the space they provide affords safety from predators. Beaver do not build dams in larger streams where there is sufficient depth and too much stream flow.

In the fall, beaver pay special attention to the construction and upkeep of their dams. They build them in a narrow place in a stream, often where some drift or logs already constricts the water flow. First, a few sticks, weeds, rocks or other natural debris are lodged in the shallow constricted area, then beaver dredge up mud from the stream bottom with their front feet and push the mud up against the sticks, weeds and other debris. The sticks hold the mud in place and keep it from washing away.

As the water level rises, more sticks are added and more mud is pushed up against the debris. The core of most beaver dams is mud. The back of the dam is sticks, weeds and other natural debris to hold the mud core of the dam together. Many people think beaver cut trees primarily for building dams. Most of the sticks and other debris used in building a dam are already in the pond or stream. The beaver simply float the material to the dam and place it.

Most beaver colonies in streams have one main dam, above which the colony lives and spends most of its time. There may be two or more smaller dams built below the main dam to give the beaver colony more space and mobility. Beaver often cross back and forth over the dams in their daily feeding routine.

Beaver often dredge channels in the upper reaches of their pond to give them added mobility. These are carefully constructed with the mud neatly furrowed out to each side. Beaver are more comfortable in the water and will go to great lengths to dig channels so they can swim rather than walk. These channels also save them energy, as beaver can tow a large tree branch in the water much easier than they can drag it on the ground.

If the bank above a den collapses, the beaver often repair it with sticks and mud.

ECONOMIC VALUE

Beaver have played an important role in settling our state and country, and continue to be appreciated by trappers and others who enjoy the benefits of living near a thriving beaver pond.

Trapping still is pursued by many Missourians even though it is not as profitable as it once was. Beaver pelt prices have fluctuated widely over the years. In colonial times, the beaver pelt was the standard or basis of value for commodities or money. The famous Hudson Bay point blanket was purchased with prime beaver pelts. The blankets were marked with lines to indicate how much they were worth. For example, a blanket marked with five points cost five beaver pelts. Hence the term "blanket" beaver.

A blanket beaver pelt is stretched in the oval or round shape and measures a total of at least 65 inches, when measured from the top of the pelt to the bottom and from one side of the pelt to the other. At a Hudson Bay trading post, an eight-point blanket would have cost eight blanket beaver pelts. Today, a prime blanket beaver pelt is worth about $15 in Missouri, while an eight-point Hudson Bay blanket sells for $245. By today's standard, it would take 16 prime beaver pelts to buy the same blanket that eight beaver pelts once purchased.

Today few people trade beaver pelts for blankets. Cash is the preferred medium of exchange. Some Missouri beaver fur is purchased by the hatter market to be made into expensive felt hats. Other pelts are used for men's and women's fur coats.

Most people don't think of beaver when they purchase perfume, but castoreum, which is extracted from the beavers' castor glands, is used as a fixative in high quality perfumes. Most of the castor sold on the market goes to the perfume trade, but it also is used to make trapping bait and lures. Many animals besides beaver are attracted to the castor smell, including coyotes, raccoons and bobcats. The explorers Lewis and Clark described in their journals how to make castor bait for trapping beaver. Modern day trappers use similar recipes. See recipe on Page 22.

Although not found on many menus today, beaver tail was considered a delicacy by early European trappers and Native Americans. Today some people still regard beaver meat as delicious, especially when cooked with barbecue sauce. See Judy Foley's recipe on Page 11.

Beaver have been a major influence on the land and on wildlife. For centuries beaver dams have backed up

Ways to cook beaver *by Ken Drenon*

Beaver can be prepared about any way you would beef: roasted, stewed, fried, pressured, canned, jerked or grilled.

Boned meat is easiest to work with. A fillet knife works well to remove the backstrap, and the two large chunks of meat available from each hind leg.

One critical factor to remember when cooking beaver is to first remove all the white fat from the exterior and both the clear and fibrous membrane from the meat. Use a fillet knife to cut the meat away from the tallow or membrane. It's a good idea to "peel" the meat even if there is no tallow because, during skinning, fluid from the castor glands may contaminate the carcass, giving the meat an off flavor, and your kitchen a peculiar odor.

After peeling you have dark red, lean cuts of meat. Wash them thoroughly and, after soaking overnight in a solution of water and baking soda, you're ready to fix your favorite recipe, substituting beaver for beef.

- Try slicing meat from a young beaver into strips. Drop the strips into a bag containing a couple of cups of flour and a couple of tablespoons of corn starch. Shake well, then place the coated strips into a deep fryer containing vegetable oil, and cook until golden brown. Drain on a paper towel, salt and pepper to taste.
- Another method is to roll up the backstrap, surround it with a strip of thick-cut bacon, peg the whole works with a couple of toothpicks and place on the grill. Cook until just done and the juicy results will be every bit as good as sirloin steak.
- Kabobs are another method of grilling. Cube the meat, place on a skewer, alternating with vegetables of your choice. Remember to use bacon on each side of the beaver cubes.
- Beaver can be ground and substituted for hamburger, but like venison, pork or beef fat is a necessary additional ingredient.
- Everyone has their favorite stew recipes; that's another natural place for beaver meat.
- There are a number of other ways to prepare beaver. *Cy Littlebee's Guide to Cooking Fish & Game*, which contains several other methods of preparing beaver, is available for purchase at **www.mdcnatureshop.com**.

—from the *Missouri Conservationist*, February 1995

silt-laden streams and subsequently formed many of the fertile valley floors in the wooded areas of North America. Their dams often stabilize stream flow and slow runoff. Ponds made by beaver dams create habitat for fish, birds, mammals and many kinds of aquatic life. Muskrats, otter, raccoons, mink, wood ducks and numerous other forms of wildlife benefit from beaver activities.

Beaver ponds create excellent wetland wildlife habitat and can provide opportunities for bird watchers, wildlife photographers and anglers. Aesthetic and educational benefits are available for people who enjoy watching and studying wildlife. Seeing the beaver dams and cuttings or glimpsing the animals collecting their food can be a wilderness experience even in heavily populated urban areas where beaver sometimes set up their territories.

Property damage caused by beaver varies from slight to significant. Beaver dams sometimes cause flooding of roads and agricultural cropland. Beavers sometimes plug up overflow tubes to ponds and watershed structures and build dams across pond spillways. By digging bank dens, these industrious rodents sometimes weaken pond dams or levees. Dens dug into stream banks adjacent to fields can undermine the bank and cause a threat to farm equipment working along the water's edge.

People who live along lakes and streams sometimes have conflicts when beaver cut down ornamental trees on their lawns. Many people also complain about beaver chewing the plastic foam that supports their boat docks. Beaver will sometime bring sticks in under the boat docks as they attempt to build lodging for themselves in the foam.

With the increase in the beaver population, more conflicts are likely to occur. This booklet offers suggestions on how to protect property while ensuring that Missouri's beaver population remains healthy.

Beaver smothered in barbecue sauce

—from the kitchen of Judy Foley of Braymer, Mo.

The size of the beaver is one of the most important aspects in preparing this meal. The preferred size should be 15 to 25 pounds. Larger ones are usually tough and have a strong game taste.

- First, take a beaver that's already been cleaned and carve off all remaining visible fat, even if you have to cut into the meat. Fat is found throughout the meat, but cutting off as much as possible will make the meat less greasy.
- Cooking the meat is a slow, all-day process. Place the trimmed meat in a large roaster and fill it with water. Cover loosely with foil and cook at 300 degrees.
- Every 1 1/2 hours drain the roaster completely. Do not throw the greasy water down the drain.
- Refill the roaster with fresh water and continue cooking. Do this at least three times. This process will draw out a lot of the fat.
- Continue to check every 1 1/2 hours, until the beaver has cooked at least 8 hours.
- At this point, the meat should fall away from the bones and most of it, except for the part closest to the bone, should be brown.
- Remove the meat from the oven, drain off the water and let stand covered with foil for about 1 hour.
- Remove the foil, and with a fork and knife tear off shreds of meat from the bones.
- Place the meat in a baking dish, and discard the bones.
- The outer parts of the meat will be fully cooked. The closer to the center, the less cooked it will be. Place the least cooked meat on top. Cover the dish with foil and bake for at least 2 hours at 300 degrees.
- While the meat is in the oven, prepare the barbecue sauce.
- Pour it over the meat, and bake uncovered for the last 45 minutes.

Barbecue sauce recipe

4 tablespoons butter or margarine
2 medium onions, minced
4 tablespoons vinegar
4 tablespoons brown sugar
4 tablespoons lemon juice
2 cups catsup
2 tablespoons Worcestershire sauce
1 tablespoon prepared mustard
1 cup water
1 cup chopped celery
1/4 teaspoon salt

Brown the onion in the butter, then add the remaining ingredients. Simmer for 30 minutes.

Nutritional Values

Beaver is higher in food energy and protein than beef, and also lower in fat.

	Calories	Protein Grams	Fat Grams
One pound beef	1,106	84.8	88.9
One pound beaver	1,125	132.5	62.1

(Source: United States Department of Agriculture, Agriculture handbook No. 456)

Viewpoints vary widely as to what constitutes beaver damage. For example, when beaver cut trees along a stream well away from people and their homes in a natural stream situation, one landowner might enjoy watching the beaver and, therefore, find the sight of their cuttings, dam and lodge aesthetically pleasing. Another might think their presence is ruining the landscape.

A farmer with 40 acres of soybeans flooded by a beaver dam has a definite problem, as does a lake-front property owner whose ornamental trees have been cut by beaver.

Because no two beaver problems are alike, the solution needs to fit the situation. Below are suggestions that may help you protect your property. If you need additional help evaluating a situation, call the conservation agent in your area.

Nonlethal methods

Once a colony of beaver establishes its territory in a pond, lake or stream it is virtually impossible to make it move somewhere else through the use of nonlethal techniques. It is sometimes possible to enjoy beavers in the area while still preserving property. The following tips may keep these rodents from being too destructive.

Saving valuable trees

Beaver cutting trees along lake front property is one of the most common complaints. If there are only a few trees to protect or if some of the trees need protection more than others, wire fencing around each individual tree could be the answer. A rigid welded-wire fence using 4-inch mesh or smaller is often effective in preventing beaver damage. The height of the fence should be at least 36 inches.

Cut the wire into widths large enough to encircle each tree, leaving 2 or 3 inches between the tree and the fence so the tree will have ample room to grow. Avoid using soft chicken wire, and never wrap the tree tightly or nail the wire to the tree. Make sure the wire is firmly attached to the ground so the beaver can't chew on the roots. As the tree continues to grow, the wire may have to be replaced every few years.

Valuable trees can be protected from beaver damage with inexpensive wire fencing.

In some situations it is possible to build a fence at the shoreline to keep beaver from leaving the water and gaining access to trees you want to protect. A fence of rigid wire fastened to steel posts and dug into the ground will exclude beaver. An apron, consisting of a strip of wire laid on the ground in front of the fence, might have to be added if beaver try to burrow underneath. Electric fencing is effective in some situations to exclude beaver from an area with desirable trees.

If there are too many trees to protect by wire fencing, the only solution may be to remove the beaver by trapping or shooting.

Protecting boat docks

Lake shorelines often slope too slowly or are too gravelly for beaver to build a bank den. Changing water levels on lakes also make bank dens less attractive. Because of the lack of better locations, beaver sometimes attempt to build living quarters in boat docks by chewing out the plastic foam flotation, which often causes damage to the dock.

Most boat docks with foam flotation have gaps between the flotation blocks. This gives the beaver access between the blocks to hollow out a cavity in the foam, much like they hollow out a chamber in a bank den. The result is a cavity in the foam under the floor of the boat dock.

One way to protect the dock is to make sure the foam blocks are butted tightly together when the flotation is replaced or when the dock is originally constructed.

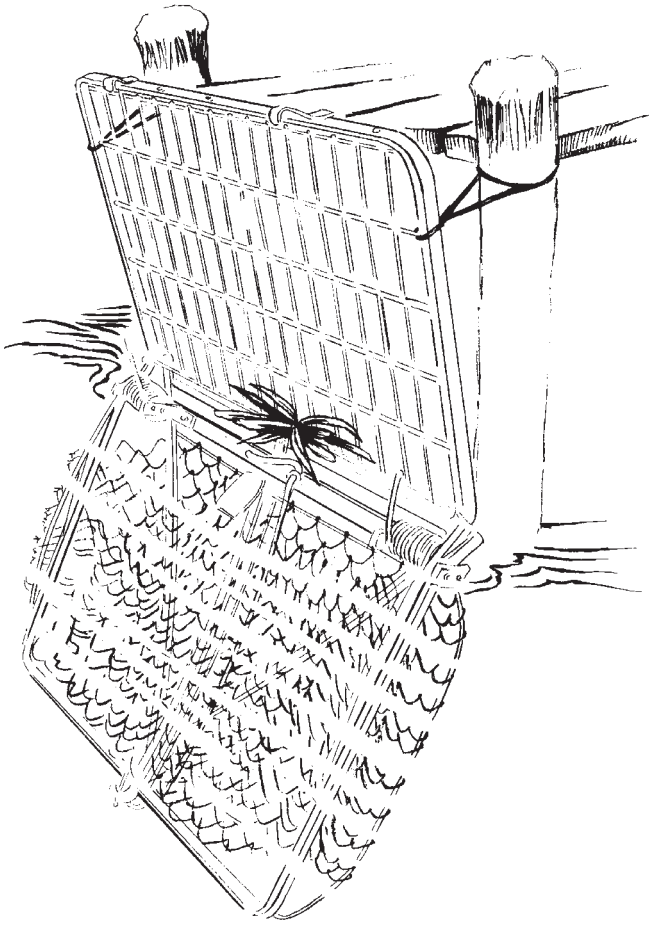
Galvanized welded wire wrapped around the flotation blocks is another way to protect a dock. The wire should be no greater than 4-inch mesh and heavy enough to resist rusting. After flotation blocks have been measured, the wire can be cut to size on the dock, then fitted around the blocks to give complete protection to the foam.

Another option is to replace the foam blocks with flotation logs encased in a hard polyethylene shell that is resistant to chewing by beaver. This flotation system is available commercially.

In large lakes, protection of the boat dock flotation system is usually the best option. Removal of nuisance beaver by trapping in large bodies of water is seldom the long-term answer because other beaver will soon replace the beaver removed.

Although usually not recommended, live trapping sometimes can be a short-term option. The Hancock-style live traps are often the best choice because they can be wired to and suspended from the dock. Body-grip and foot-hold traps, as well as snares, work best when set in shallower water near the bank. They are not effective in the deeper water surrounding docks.

A suitcase-style live trap with willow twigs and castor used as bait can help eliminate beaver in deep water around boat docks.



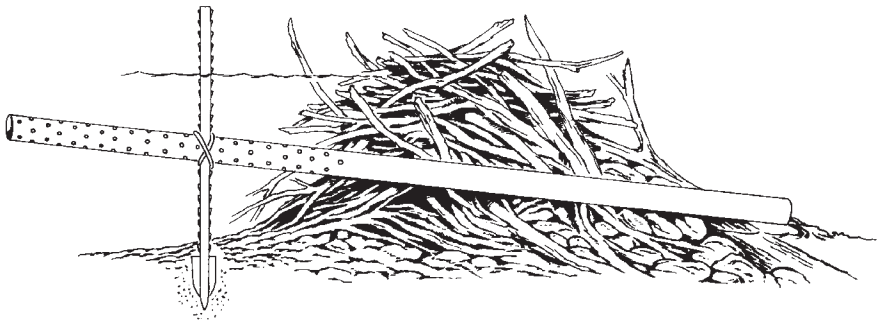
Live traps work best at boat docks if only one or two beaver are causing the problem. If several beaver are involved, the beaver may become wise to the traps before all the animals are caught. Beaver removal to control damage at boat docks should be a last resort.

Keeping overflow tubes unplugged

Beaver often move up small streams and establish themselves in watershed structures and farm ponds. Once in the ponds they usually plug up the overflow tubes. This can cause erosion to the pond dam if the water level is raised enough for the water to flow over the dam. Pond dams can be seriously damaged or ruined as a result.

Research has shown that the sound and movement of running water motivate beaver to plug overflow tubes and repair breaks in dams. This behavior is thought to have evolved from the need to maintain a constant water depth adequate for protection from natural predators and for daily movement to feeding sites. However, during periods of heavy rain, beaver may allow leaks in dams or in plugged drain tubes to go unrepaired instead of doing their usual nightly ritual of checking and plugging even the small leaks.

Various devices have been developed over the years to cope with this behavior. The Clemson pond leveler consists of a 10-inch intake pipe that is pierced with numerous 2-inch diameter holes. These holes take in water at a slow and steady rate, which beaver can't detect. The intake pipe is suspended inside a welded wire cylinder that prevents beaver from plugging



With a perforated pipe installed on the upstream side of a beaver dam, water level and flooding can be controlled without removing the beaver.

the small holes. The intake pipe is attached to the existing drain pipe and held securely in place by steel posts.

Another method is to place .4 gauge or 1/4 inch diameter galvanized welded-wire panels with a 4 x 4 inch mesh around an overflow pipe to keep beaver from directly plugging the drain tube. Commercially available hog and cattle panels can be used. Build the fencing in a semicircle in the water a few feet in front of the overflow pipe. The ends of the fencing should be up against each end of the pond's dam. This should keep the beaver out because they prefer to approach a potential dam site from the water. Push the panels into the mud so the beaver cannot swim under them. Held up with steel posts, this fencing often is all that is needed to keep beaver from plugging up a culvert and damaging a pond.

Beaver may still build a dam against the welded wire panel, but the panel will prevent the complete plugging of the overflow tube. This solution requires some maintenance to remove sticks and other debris that the beaver place in the wire panels.

In the case of a plugged drain tube or road culvert, the dam should be removed, and a heavy wire mesh fence of No. 6 concrete re-enforcing wire should be installed around the mouth of the culvert and secured with steel posts. If the beaver build a dam on the fence, a perforated tube can be placed through the fence to keep the water at the desired level.

Many of the techniques for preventing beaver from plugging drain tubes and culverts aren't economically feasible to apply over large areas. Also, these techniques often are only a temporary solution.

Deterring burrowing in dams

Beaver can cause serious damage to pond dams when they burrow to make bank dens. Once beaver have begun digging into pond dams, usually the only option is to remove them.

Preventing damage from beaver should begin when the pond or lake is being built. Give the new dam a 3-to-1 slope and rip-rap with large rock about the size of a bowling ball. This will help discourage beaver and other animals from burrowing. Large quantities of rock dumped into the water along the dam of an established pond or lake also can be effective in controlling burrowing.

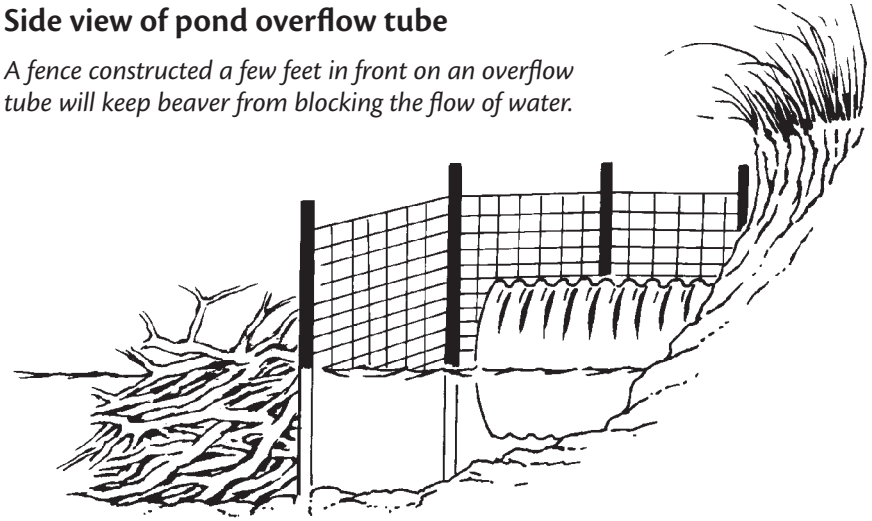
Controlling flooding

Flooding sometimes can be controlled while keeping the beaver colony in the area, but it often takes more time and energy than lethal methods. One option is to tear out the existing dam and construct a woven wire fence across the stream at a constricted place a short distance upstream. This method may cause the beaver to build back the dam against the woven wire fence or in another location where it will not be a problem.

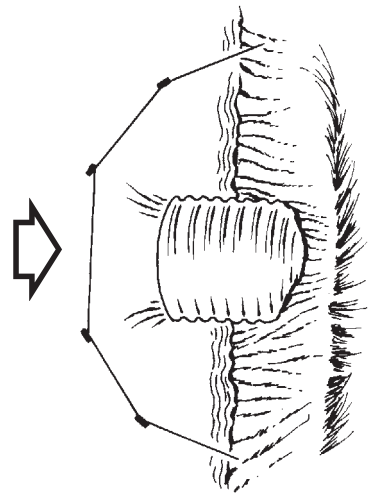
Perforated pipes can be installed in beaver dams to regulate flow, but they require almost constant maintenance because debris and siltation clog the

Side view of pond overflow tube

A fence constructed a few feet in front on an overflow tube will keep beaver from blocking the flow of water.



Top view of pond overflow tube



pipe. On the positive side, installing a pipe not only eliminates or reduces beaver damage, but also preserves the colony and the habitat enjoyed by many other wildlife species.

Destroying dams

Destroying dams by hand or with a backhoe is often tried to make beaver move, but it is usually ineffective because they will quickly repair the broken dams. There are no repellents that will cause beaver to leave an established territory. Diesel fuel or other chemicals usually do not discourage beaver and only results in polluting the water.

In situations where beaver damage is not too great and lethal methods of control are not desirable, it may be best to just live with the problem.

In some cases, a combination of animal removal and nonlethal options may be the answer. Because beaver are a fairly shy animal, trapping, combined with lodge and dam destruction, can sometimes cause some of them to move to an area where they may not be considered a nuisance.

Live trapping

Although live trapping and releasing the animals at another location may sound like a good way to solve a nuisance beaver problem, it usually doesn't work. Relocating beaver can mean transferring the animals to another location where they may again cause problems. Also, most landowners do not want someone else's problem beaver released on or near their property.

Because of Missouri's high beaver population, it is difficult to find a place to release them. These animals are very territorial, and any beaver relocated into suitable habitat is sure to encounter other beaver in their established territories. The newly introduced beaver, which is disoriented and at a disadvantage, are often viciously attacked and sometimes die from these encounters.

Live trapping beaver is not a simple process. It is very difficult to successfully live trap and move an entire colony of beaver. Even if a pair of beaver and young of the year in an established colony could be successfully live trapped and moved, the chances of the family staying together as a unit is remote. The family would be disoriented and would scatter, and the young of the year may not survive. Also, female beaver should not be trapped and released before the young are old enough to survive on their own.

Studies indicate that most wildlife that are live trapped and relocated have a high mortality rate when released in areas with established populations of the same species. Because beaver are very territorial, the mortality rate from stress and fighting is sure to be high.

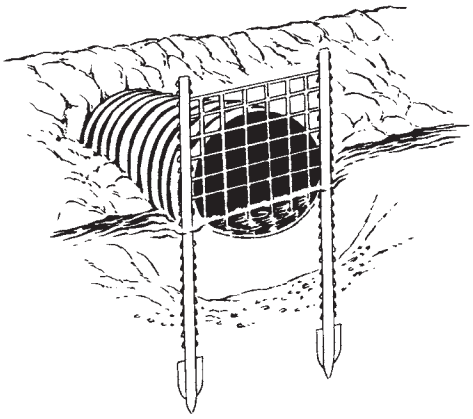
Live trapping may be the only option available in areas where city ordinances prohibit the use of body-grip or foothold traps, or at boat docks where the water often is deep. Hancock-style live traps can be used in a variety of situations from vertical banks or sides of boat docks to gently sloping lake shores. They can be baited with green willow or cottonwood twigs, scented with beaver castor, and effectively used to live trap beaver. Conventional live traps, such as the wire cage terrestrial traps used to capture raccoons, squirrels, skunks and other land animals are not effective for beaver.

The Hancock-style live traps are large and close with a strong force. Every precaution should be taken to make sure an unsuspecting person does not accidentally spring the trap and get injured.

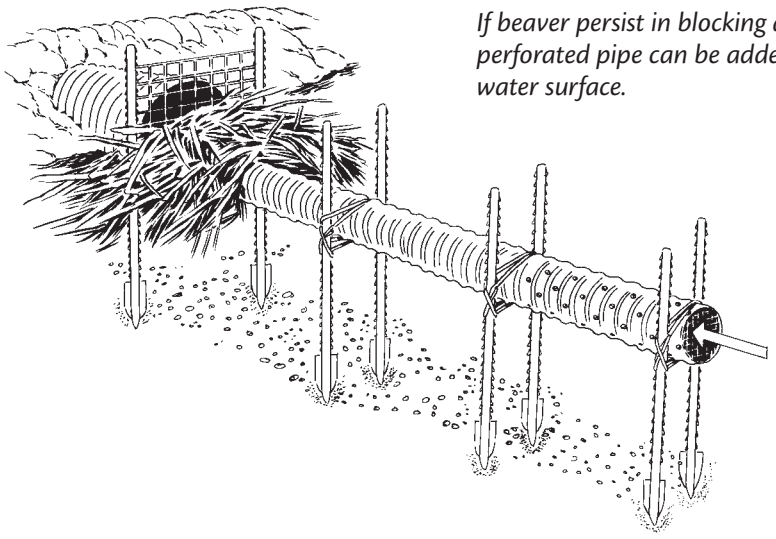
Lethal methods

While not all animals fall under this provision, the *Wildlife Code of Missouri*, under Rule 4.130, allows landowners to use lethal methods to protect their property from nuisance beaver any time of the year.

Property owners also may hire someone to trap or hunt nuisance animals for them. Beaver that are causing



A heavy wire mesh fence can sometimes keep beaver from plugging a culvert or overflow pipe.



If beaver persist in blocking a culvert, a perforated pipe can be added below the water surface.

property damage may be taken at any time and without permit, but only by shooting or trapping except with written authorization of the director of the Conservation Department.

Under this provision, beaver may be controlled only on the owner's property to prevent further damage. Nuisance beaver captured or killed out of season may not be used, transported, sold or given away, and must be reported to an agent of the Conservation Department within 24 hours and disposed of in accordance with the agent's instructions.

These rules do not apply to all animals. Special permission is required to destroy migratory birds, deer, turkey, black bears and endangered species. Check with a conservation agent or the *Wildlife Code of Missouri* for more details.

Shooting

According to Rule 4.130 of the *Wildlife Code of Missouri*, landowners may not shoot beaver unless the animals are causing damage to their property. Because shooting problem beaver can be time consuming, this method works best in isolated cases when only a few beaver are causing damage.

Since beaver are mostly nocturnal, the best time to try to shoot them is just after sundown. If the local conservation agent approves, a landowner may use an artificial light to hold a beaver still long enough to take aim and shoot. Beaver do not have good eyesight above water, so it usually isn't necessary to hide as long as the shooter stays motionless and keeps low. The best locations are near lodges or newly broken beaver dams.

Safety is a major concern when shooting across water, especially in a residential area. Always check city ordinances that may prohibit the use of firearms. A shotgun loaded with heavy shot—No. 4s or larger—at close range is the recommended choice. A rifle should be used only in the hands of an experienced shooter because rifle bullets can ricochet off water.

Trapping

The use of traps for problem beaver must be in compliance with the Conservation Department's regulations. The main provisions are listed below. For more details, see Rule 8.510 of the *Wildlife Code*.

- Traps must be attended daily.
- Traps must be metal with smooth or rubber jaws.
- Traps must be labeled with the user's name and address.
- Traps must not be set in paths made or used by people or domestic animals.
- Body-grip traps set for beaver must be underwater.
- Special written authorization is needed before snares can be used anywhere but underwater.

In most cases, trapping beaver with foot-hold traps, body-grip traps or snares are the best options for catching nuisance beaver. A Conservation Department wildlife damage control biologist can sell these tools at cost to a landowner for use in controlling nuisance beaver. Additionally, these damage control biologists can provide special authorization to use snares above water, which are otherwise illegal in Missouri.

A landowner with no experience in using traps or snares should contact the local conservation agent, who will help set up a training session with a wildlife damage control biologist. An alternative to landowners doing the trapping themselves would be to contact a local trapper who could catch the problem beaver during the regular trapping season or whenever the damage is occurring, provided the local conservation agent is notified. Often agents can provide a list of experienced trappers in the area who deal with nuisance animal problems.

When trapping beaver in damage situations, it is desirable to trap all the beaver in the colony. Even one beaver may continue to plug drain tubes, cut trees or rebuild dams. Several traps and trapping methods have proven effective in controlling nuisance beaver. Select the trap and method from the ones listed below that best suits your situation.

Body-grip traps

Body-grip traps, like the #330 Conibear, are most commonly used by beaver trappers in Missouri.

These traps can be set for beaver in a variety of situations. The most common place to set a body-grip trap is at the entrances to bank dens or lodges. These traps also are effective when set in channels the beaver have dug, or in places where the stream or a channel is narrowly restricted. The water passage should be further restricted with sticks stuck upright into the mud to cause the beaver to swim through the trap. Willow or cottonwood sticks sometimes work as bait when trapping under ice with these traps.

If castor is used as a lure, a trapper can dig a trench in which to place the trap. Natural inlets or trails worn by the beaver as they enter and leave the water make good locations for castor sets using body-grip traps.

Body-grip traps are more versatile than snares and other traps because they can be used at many different types of locations. A disadvantage is that these powerful traps are difficult for some people to set. A trap-setting tool is available commercially, or you can make your own using an 8-foot section of nylon rope with a permanent loop tied in one end. Place your foot through the loop, thread the rope up through the spring eyes of the trap, then around and up through the spring eyes again. Pull on the rope to compress the springs.

Occasionally, beaver trappers choose the smaller size body-grip traps. Experience shows this to be a poor choice because even the #330 size traps with a 10-inch jaw span may not be large enough to catch some of the larger adults. A 70-pound beaver, for example, is too large to get more than its head in a 10-inch #330 body-grip trap, so the smaller 7- or 8-inch body-grip traps are much too small. The smaller body-grip traps catch more non-target animals, while the larger 10-inch trap with the trigger set to one side will permit some muskrats to swim through without being caught.

Body-grip traps can be effective when set in shallow water at a lodge entrance. To reduce catching smaller nontarget animals, set the trigger to one side.

Bank-den sets

All entrances to all active bank dens must be set to eliminate a colony of beaver. If only some of the active bank-den or lodge entrances are set, the beaver will soon become wise to the traps and avoid using those entrances. This will make them more difficult to trap with the body-grip traps in any situation afterward. If an entire colony is to be trapped, it must be done as quickly as possible, preferably in one or two nights.

To set the traps at the deeper bank-dens or lodge entrances, chest waders are essential. Even then, there may be entrances to bank dens and lodges that cannot be set because they are in 5 or 6 feet of water. In these cases, setting the bank dens in conjunction with traps at other locations baited with castor may catch the remaining animals. If there are only two or three bank-dens or lodge entrances, body-grip traps work well alone.

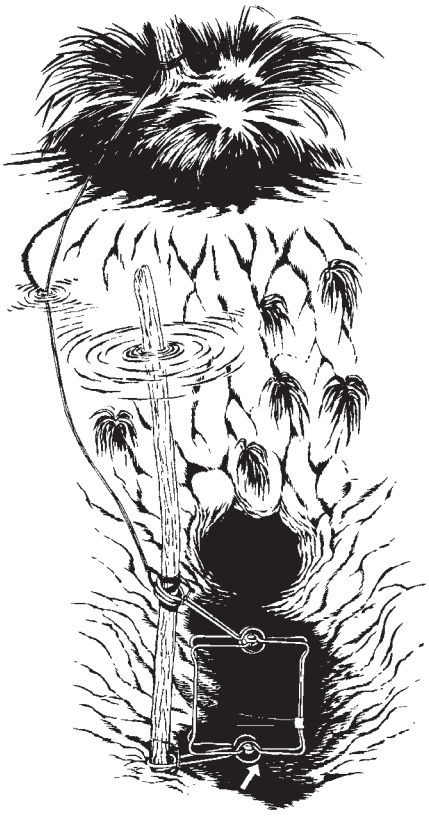
If thick ice covers the stream or pond, the bank-den or lodge entrances sets are the best option. It is possible to trap beaver in baited traps under the ice, but this method isn't very effective in Missouri. Because of the state's mild winters, beaver aren't locked under the ice for long periods of time, have access to fresh food and aren't easily enticed to bait.

During spring and summer, bank dens may be hard to locate because their entrances are not marked by the peeled sticks and other sign, such as the scoured appearance of the bottom of the entrance and droppings around

the area. Also, there may be several bank dens in a stream or pond, and locating all of them may be difficult. Beaver do not require much in the way of shelter in summer and may move from one den to another. The lodges are usually obvious, but in spring and summer beaver may abandon them when traps are set. In spring and summer, body-grip traps or snares baited with castor and set in trenches or channels are often more productive.

If the bank dens are shallow, set a body-grip trap by resting it on the bottom of the entrance with the trigger on top and to one side. This will help avoid catching muskrats that also may be using the lodges or dens.

The trap can be held upright with a couple of slender sticks small enough to go between the corners of the steel jaws. These sticks should be pushed in the mud at an angle through the springs of the trap so that both sticks cross on top of the trap. A few more sticks may be placed on either side to guide the beaver into the trap. Beaver usually swim on the bottom when they enter or exit their dens, therefore dive sticks placed across the top of the trap on the water surface are not usually needed. Always wire the body-grip traps securely to a stake or sapling on the bank so that the beaver and the trap can be recovered.



A Conibear-style trap can be attached to a pole so it can be set in deep water in front of a den opening.

If the lodge entrance is in deep water, a body-grip trap can be wired to a pole after both springs are pulled to the side away from the trigger at a 45 degree angle. The pole with the attached trap is then pushed into the mud so the trap is on the bottom in front of the entrance. The trigger in this case should be on the bottom, and the top safety catch should be wired back so the trap's jaws or springs don't catch.

This set also can be made by pushing a pole into the mud to one side of the lodge's entrance, then sliding the rings of the springs over the pole until the trap rests on the bottom. A long slender stick can be pushed into the mud to cross between the trap's jaws to keep it from swinging on the pole. The safety catches should be wired back and the trap securely wired to a sapling or root on the bank, so the animal and trap can be retrieved.

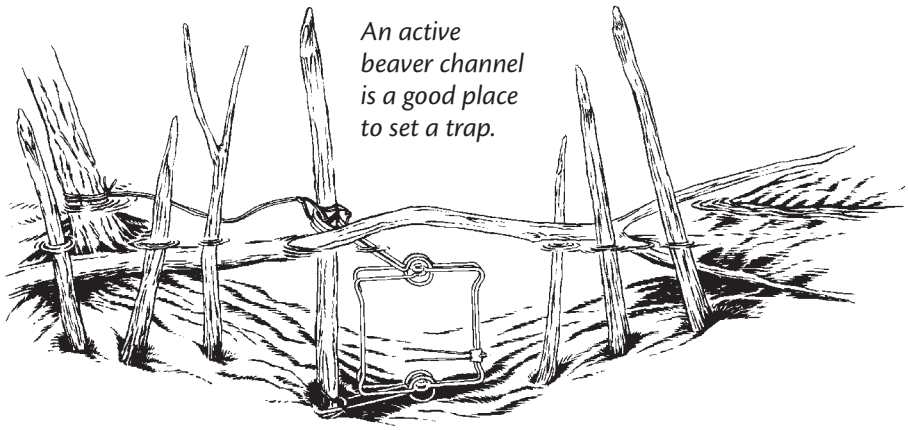
To be most effective, every active bank den should be set. Care should be taken when working with body-grip traps because they are powerful and can cause injury to the trapper. Body-grip traps must be completely underwater to be legal and should never be set where people or pets might get caught in them when wading or swimming.

To find bank-den and lodge entrances under ice, look for the presence of bubbles, which indicates beaver activity. If the lodge is an active one, there probably will be a number of white peeled sticks collected under the ice just above the entrances. If snow has been on the ice for a few days, look for separation of snow and ice at the bank, which indicates a bank den. Peeled sticks may be visible. The ice also is thinner right over the entrances because of the activity of the beaver swimming in and out.

Beaver trapping at bank dens under the ice is effective if all bank-den and lodge entrances can be located and set. Sometimes the entrances will be under the feed bed or in water that is too deep to set. In such cases, it is best to wait until the ice melts and trap the beaver at castor sets along the bank.

Channel sets

Properly placed channel sets can be the most effective use of body-grip traps. Usually channel sets are placed where the beaver will swim into the trap without being enticed by bait or lure. The most effective channel sets are those made in streams after the dams have been broken and most of the water drained out. The low water conditions will often reveal good



An active beaver channel is a good place to set a trap.

locations for body-grip traps, such as channels that the beaver have dug or restricted areas that can be fenced off with sticks. If a narrow channel in a beaver pond can be located or created, it can have the potential for catching every beaver in the colony.

A natural inlet in the bank or a place where a small creek comes in offers another good channel set location. Occasionally, beaver will be castor mounding in these locations. To be most effective, place the trap in the channel, fence it off with sticks on either side, and put a dive stick at the water's surface or just below to keep the beaver from swimming over the trap. If castor mounding activity is noted in the inlet, the addition of some castor lure may draw the beaver into the trap.

Beaver also use channels to swim from a denning area to a feeding place. If a channel is located under the ice, a hole can be chopped above it so the trap can be put in place. Use sticks to narrow the area and to guide the beaver into the trap.

Using castor

In open water conditions, beaver can readily be drawn to a trap with a lure made from the castor glands of beaver. Castor lure also is available commercially. It is important to use a good quality lure. Some trappers argue that beaver can only be trapped using castor lure during mating season. However, beaver do some castor mounding year-round and respond readily to castor lure at trap sets during any season. Both male and female beaver react to castor as a territorial response. Beaver instinctively respond to the castor lure placed at sets in their territory, much as people respond to discovering an intruder has invaded their home or yard. Beaver react to the evidence—in this case, the castor—by becoming excited or upset and making an effort to further investigate the apparent intrusion.

Just prior to and during the mating season, more evidence of castor mounding can be found along stream or pond banks than any other time of the year. The castor mound may be just a small blob of mud and sticks pulled up on the bank, or it may be a larger conical mound that different beaver have added to for years. Castor mounds are usually present in areas where beaver live.

In selecting locations for trap or snare sets using castor, it isn't necessary to find the beavers' actual castor mounds although these locations always are good.

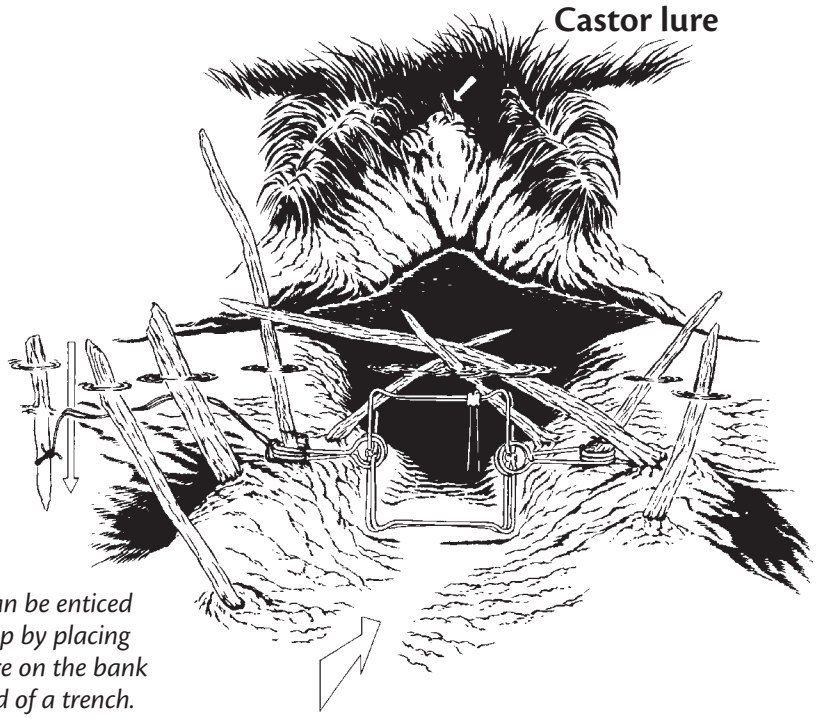
Castor sets can be made at any location along streams, lakes or ponds where beaver are actively leaving signs of their presence. It is important to choose locations near areas where beaver swim during their nightly activities. Castor sets can be made in the water at the bottom of trails where beaver go up on the bank to feed, near bank dens or lodges, near beaver dams or along pond dams or levees where the beaver have a crossover trail. At the crossover trails, castor sets should be made to one side of the trail if river otter are in the same area to avoid catching them. Small breaks in beaver dams or breaks in plugged tubes at farm ponds can be used to draw beaver to the area, then baited traps can be set.

When using castor, many trappers build a "mud pie" by making a little mound of mud and leaves on the bank to imitate a beaver castor mound. Experience has shown that this really isn't necessary. An inlet or trench dug into the bank and smeared with the mud is effective in attracting the beaver to the castor and into the trap or snare.

Body-grip traps, snares or foot-hold traps can be baited with castor. Foothold traps are probably a lesser choice because of the unpredictability of just where to place the trap to get the beaver to step in it.

Castor sets using body-grip traps

Once the location has been chosen for a castor set using a body-grip trap, use a spade to cut a trench into the bank. The trench should resemble a deep trail worn by the beaver as they leave the water and go up on the bank. If possible the location should be where the bank isn't too steep or too sloping. The bank should be a firm mud bank



Beaver can be enticed into a trap by placing castor lure on the bank at the end of a trench.

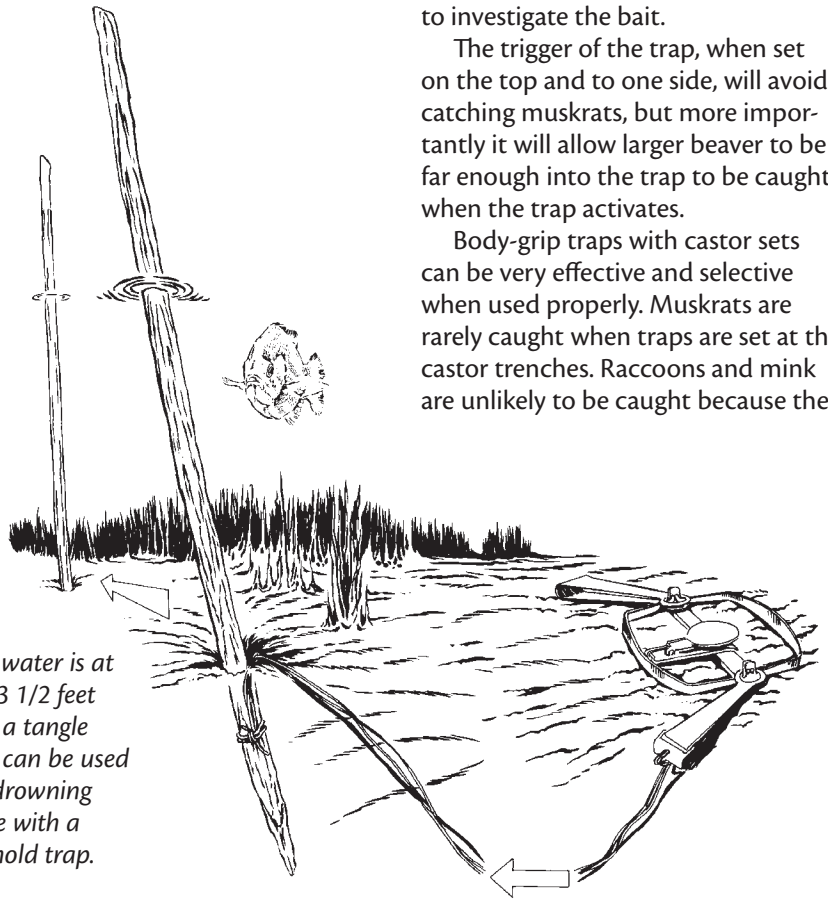
free of tree roots or rocks. For the #330 body-grip trap, the trench should be dug 14 inches deep at the shoreline and 16 inches wide. The trench should be dug to extend well out into the water and up into the bank about 3 feet. The end of the trench on the bank should be sloped to resemble a beaver trail. The body-grip trap should fit down into the trench so that it is completely underwater at the shoreline and has a couple of inches clearance underneath it. The trap is kept off the bottom so mud won't settle around the bottom jaws and slow or impede the trap's action. The set springs of the trap can rest on the sides of the trench in such a manner as to support the trap and keep it off the bottom of the trench.

Two dry slender sticks about 1/2 inch in diameter and 14 inches to 16 inches long are pushed down on an angle between the top corners of the jaws of the set trap and between the springs to support the trap and to serve as guide sticks. Other sticks can be pushed upright into the mud on either side of the trap if needed to fence off the trap and to prevent the beaver from going around the trap and up the bank. Because these powerful animals may struggle for a few minutes, the trap needs to be securely wired to a stake firmly driven into the bank or around the base of a nearby sapling. The upper end of the trench should be smeared with mud to make it look shiny and give it a "beaver used" appearance.

A dive stick at least 2 or 3 inches in diameter should be placed on or near the water just above the trap to make the beaver dive under the water and into the trap. The castor should be placed at the upper end of the trench just 3 or 4 inches above water level. The castor should not be placed too high on the bank, or the beaver will have a tendency to climb the bank around the trench. Guide sticks set in the trench to the sides of the trap, coupled with the placement of the castor, should cause the beaver to swim through the trap as it enters the trench to investigate the bait.

The trigger of the trap, when set on the top and to one side, will avoid catching muskrats, but more importantly it will allow larger beaver to be far enough into the trap to be caught when the trap activates.

Body-grip traps with castor sets can be very effective and selective when used properly. Muskrats are rarely caught when traps are set at the castor trenches. Raccoons and mink are unlikely to be caught because they normally travel the shoreline and not enter the trap, and otter seem to avoid the castor trenches. Dogs or other pets aren't going to be in the minimum 14-inches of water where the traps are set. When using the body-grip trap in a trench set, there is no need to construct a drowning device since the trap is designed to kill the beaver almost instantly. This set allows the trapper to pick the key location and let the beaver come to the set. Often three or four castor sets will take a pair of beaver from a pond the first night of trapping if the sets are located and constructed properly.



If the water is at least 3 1/2 feet deep, a tangle stake can be used as a drowning device with a foot-hold trap.

Castor sets using foot-hold traps

Castor sets also work with foot-hold traps, but they are trickier to use. Because even experienced trappers often have sprung foot-hold traps with no catch, less experienced trappers will want to start out with body-grip traps. Even with the trapper's care and experience, foot-hold traps are more likely to catch non-target animals such as muskrats, raccoons or otter.

The trench for a foot-hold trap can be subtle compared to the deep trench necessary for a body-grip trap. A small trench can be dug into the bank to resemble a slightly worn trail with a short lead into the bank, which lets water flow into the inlet and gives the beaver a place to approach. The trap should be bedded firmly and level in about 8 inches of water. A larger foot-hold trap with a 6-inch jaw spread should be used. Hind-foot catches are common because beaver are likely to swim up to the bank and step in the trap set with a back foot.

The trap should be set slightly off to one side to allow for the spacing of the beaver's feet. When using foot-hold traps, it is necessary to set them adjacent to at least 3 1/2 feet of water and rig a device to drown the beaver. Otherwise, the animal may wring off its foot and escape.

If the stream or pond bottom is mud, a stake and a tangle stake works well as a drowning device. The stakes should be dry, solid poles long enough to be driven well down into the mud. If the poles are made of green wood, the beaver may cut them off. The wire should be tied off low to the stake, which is then driven firmly into the mud bottom because beaver will sometimes chew it off. The stake and tangle stake are both driven into the mud in water at least 3 feet deep and spaced 2 or 3 feet apart so that the beaver, when caught, wraps around the stakes.

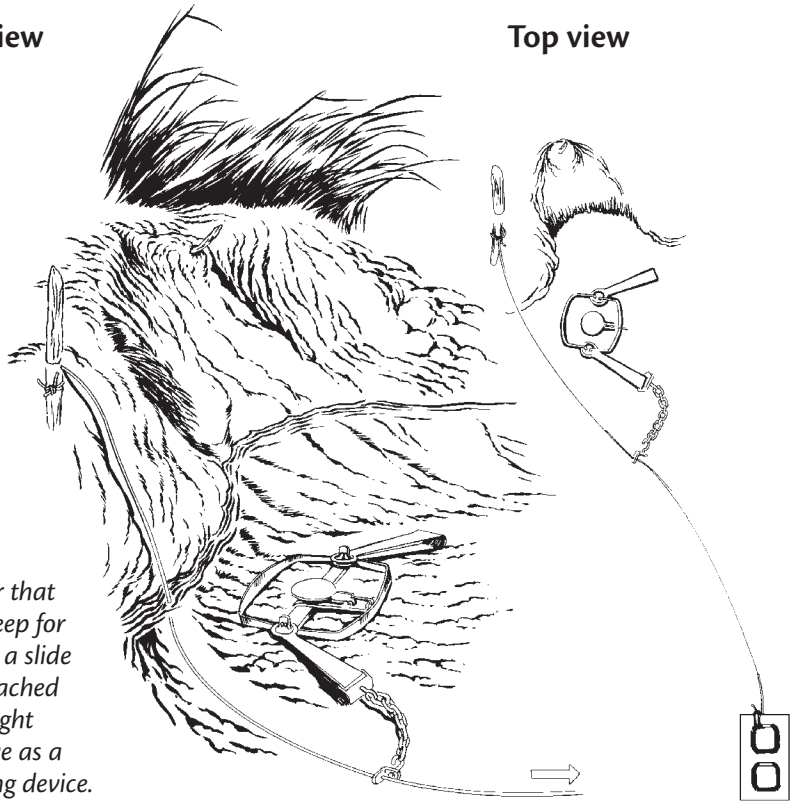
After the first wrap, the beaver is in water too deep to reach the bank or touch the bottom. Sixteen-gauge tie wire, doubled and twisted together to form a cable, can be used. To be effective, the length of wire from the trap to the anchor stake must be long enough to reach from the anchor stake to the tangle stake. The stakes should be driven so they are angled away from the bank and each other to help work the beaver closer to the bottom.

Another drowning system is a slide lock device. Slide locks are usually "L" shaped pieces of metal with one end attached to the trap chain. A hole, drilled in the other end, allows a place to run the stake wire through the lock. Wire used for the drowning device should be at least 16 gauge. Smaller wire can be used if it is doubled. One end of the wire is tied securely to a stake on the bank near where the trap is set, and the other end is tied to a stake or to a weight of at least 20 pounds that is in water at least 3 feet deep. The wire should be pulled tight with no kinks that will impede the slide lock. Beaver, when caught in the trap, will dive and work down the one-way slide lock until they are in deep water, where they will drown.

Slide lock devices can be very effective and may be the only option if the stream bed is rocky or gravelly and stakes cannot be used. It is important when using these drowning devices to make sure that the water is deep enough. One of the biggest mistakes that beginning beaver trappers make is to have the weight on the drowning device in only 1 foot or 2 feet of water, which isn't adequate to drown beaver.

An advantage of the slide lock drowning device is that the weight can be thrown into the deep water—without the trapper actually having to wade in. To retrieve the captured animal, the trapper merely pulls the wire out of the deep water. Heavy feed sacks—filled with rocks, sand or dirt and tied off to the wire—make a good weight. Cinder blocks or heavy rocks also work.

If a stake is used in deep water instead of a weight, the wire should be tied near the end of the stick so that when the stick is driven into the mud, the wire is buried in the stream bed. The stakes should be firmly driven or pushed into the stream bottom, but not so much so that the trapper cannot pull them up.



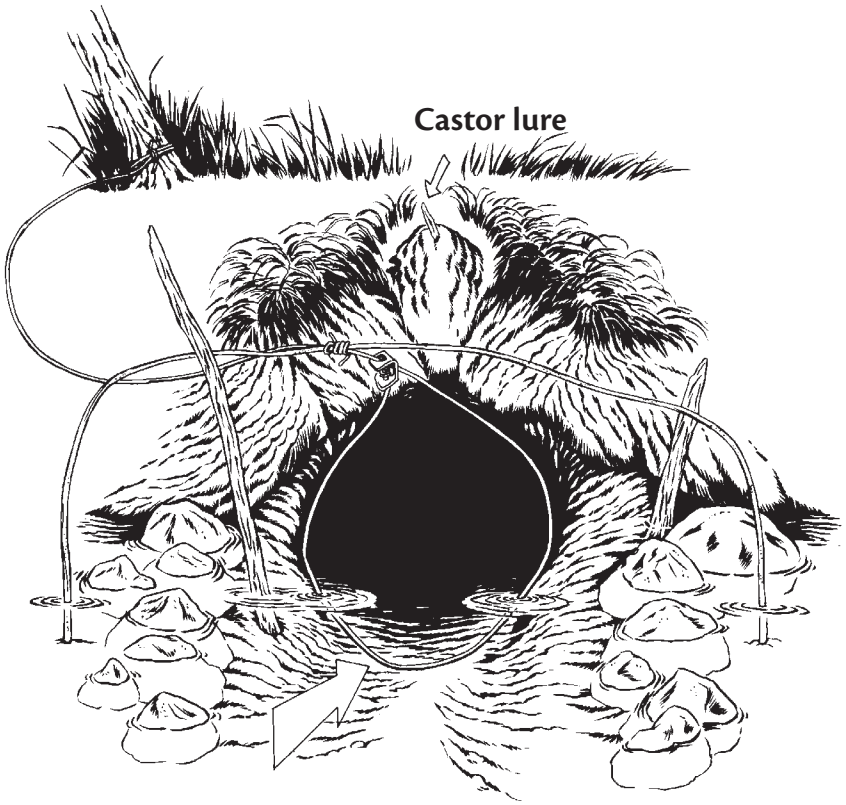
In water that is too deep for wading, a slide lock attached to a weight will serve as a drowning device.

Castor sets using snares

Although dry-land snare sets using castor are very effective, they can be used only after receiving training and written authorization from the Conservation Department. Snares offer the following advantages: the sets are easy to put in place; a minimum of work is needed to prepare the site; they are light to carry, cheap to buy; and they pose no danger to humans. In urban areas where body-grip traps or foot-hold traps are prohibited by city ordinance, snares can be used to catch beaver alive for later euthanasia. Snares are less likely to catch otters than body-grip traps.

To use a snare, construct a shallow trench like the ones used with a body-grip trap. Put a 9- to 10-inch loop size in the snare. Securely tie the snare to a nearby sapling or stake. If desired, a drowning device can be used. Snared beaver are usually caught just behind the front shoulders.

Using snares has its disadvantages. The beaver will normally remain alive unless a drowning device is used. Also, late in the summer, when young beaver



Snares are effective at catching beaver, but their use anywhere but underwater requires special authorization.

become active and are moving around, they may trip the snares without getting caught. The loop size that would ordinarily be right for an adult beaver is too large for a young beaver. High wind, heavy rain or anything bumping the snare may cause the loop to close.

Snares also can be used on land trails that lead to cornfields or trees. Snares should be used out of water only when necessary because of the possibility of nontarget catches.

Again, special authorization is required to use snares anywhere but underwater.

Castor lure recipe

Castor-based lure for beaver trapping can be purchased from various trapping supply dealers, but many trappers prefer making their own.

After removing the pair of castor glands from a beaver, dry them for four to seven days at 70 degrees F until they are cured to a semi-dry state. The castors can be sold on the market in this stage or made into a lure. If you are making your own lure, you also will want to remove and save the oil sacs.

To make a lure, grind the semi-dry castors in a meat grinder. Then mix the ground castors with the oil from the sacs taken from the same beaver. Add enough glycerin to make a heavy paste. Add six or eight drops of oil of sweet birch to 4 ounces of castor. If too much oil of sweet birch is added, it will dominate the castor smell. Oil of sweet birch and ground beaver castor can be purchased from trapper supply dealers.

Oil of anise, which is available from herb and spice shops, can be substituted for sweet birch oil. Use anise oil sparingly—between six and eight drops. Add a little at a time and sniff. As with sweet birch oil, the anise oil should just be discernible. The castor should be the dominate smell.

Castor mixed with the beaver's own oil and glycerin can be used without the addition of the birch or anise oil to effectively trap beaver, but the oil of sweet birch seems to make the castor more attractive. Additional oil from the oil sacs of freshly caught beaver always can be added to enhance the lure.

Some trappers use only the oil from the oil sacs to trap beaver. The recipe above, however, is time proven and reliable. Some of the commercially available beaver lures are not as dependable.

Don't use castor to trap members of the same beaver colony from which the castor has been taken. Beaver are more attracted to beaver castor from other colonies.

Controlling problem beaver in small streams

A combination of dam destruction and trapping can effectively control beaver that cause problems by building dams in small streams. Sometimes there is only one dam to remove, but often beaver will build a series of dams. If so, the colony usually will live above the largest dam that is the uppermost in the series. When there is more than one, the beaver usually will move back and forth among them. Sometimes, however, members of the beaver colony may be scattered up and down the stream in different locations and above different dams.

The dams sometimes look quite formidable, with a height of 5 feet or more and water backed up the stream for quite some distance. However, if the stream isn't too large and if the flow isn't too great, the dams can be torn out, the water level dropped and body-grip traps set in narrowed off places in the stream or in channels beaver have made. Often the problem can be resolved in 24 to 48 hours.

Simply breaking a hole in the dam is not enough disturbance to discourage beaver. They usually will repair these breaks in the dam the same night. To be effective, the breaks must be deep

and wide enough to drain the water from the pool, thus placing the beaver in a vulnerable position when they come to repair the dam.

Secondary dams should be destroyed first, starting with the dam furthest downstream and working upstream from one dam to the next.

With the proper equipment, most beaver dams can be breached with hand tools and the water can be drained within a few hours. A mattock, a hand tool with a pick bit on one side and a horizontally widened bit on the other, is the best tool for destroying a dam. Chest waders and shoulder length rubber gloves also are needed, especially if the weather is cold.

A backhoe, dragline or dynamite can be used, but is not recommended. In many cases heavy equipment cannot be moved into position along the stream. Also, backhoes and draglines are expensive. Dynamite is dangerous and hard to obtain.

To break a beaver dam using hand tools, first choose the area where the stream channel below the dam is the deepest. This will allow as much water as possible to be drained. Clear away all sticks in preparation for making a 3- or 4-foot wide break that will be as deep as the stream channel behind the dam. An axe comes in handy for cutting out an occasional stick or small log that is lodged in the dam.

When most of the sticks on the back of the dam have been cleared away, take the mattock and strike into the dam's top rim to get a flow of water started. Stand directly downstream below the break. Use the mattock to loosen the mud, sticks, and debris and pull them downstream with the flow. Be sure to start the break at least 3 or 4 feet wide. An even wider break will drain the water more quickly. Once the water flow becomes heavy, you can stand on top of the dam to continue deepening the break. The water flow will carry away the mud and debris.

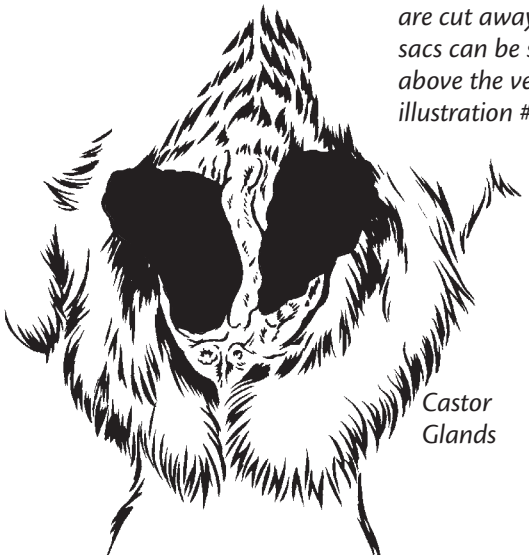
If the water flow becomes rapid and heavy, wait for it to run down before work is resumed. Most beaver dams in small streams can be broken out in a few minutes to an hour depending on their size. The break must be kept wide enough and cut down deep enough to allow the water to drain out as quickly as possible.

As soon as the secondary dams are breached, the main dam, where most of the colony lives, can be destroyed. A rifle or shotgun should be kept handy because occasionally when the beaver become disturbed by the rapid fall of the water level, they surface and can be shot. Once all the dams are broken and the water level has dropped, it is easier to locate the bank dens or lodges where the beaver are living. At this point, several body-grip traps can be set in the existing channels or narrowed places in the stream between the bank dens and the break in the dam. The beaver are vulnerable at this point because the water that afforded them safety and mobility is gone. They easily can be caught in body-grip traps when they attempt to escape from the lodges or to rebuild the dams.

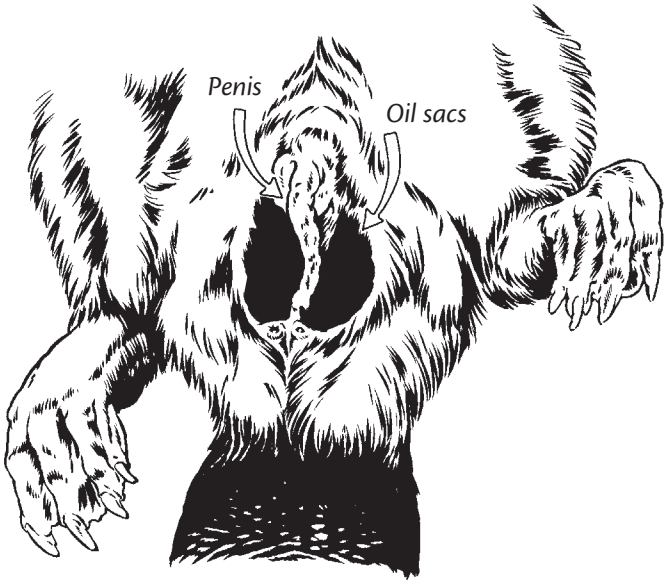
Enough traps should be used to catch all the beaver in the colony in the first night or two. If some of the runs leading into the bank dens still have water in them, they can be set with body-grip traps. Traps should be maintained until all the beaver in the colony have been trapped or have left.

It is a waste of time and energy to break the dams without following up with trapping. The beaver will rebuild the dams, and the problem remains.

Occasionally beaver will dam or plug overflow tubes in large lakes or impoundments of water that can't be



After the castor glands are cut away, the oil sacs can be seen just above the vent as in illustration #2.



quickly or easily drained. In such cases, set body-grip traps above a break in the dam if a channel or narrow place in the immediate vicinity of the dam can be fenced off.

Foot-hold traps often are effective when placed at the break in water approximately 8 inches deep and 10 inches behind the dam. That way, they will catch the beaver as they approach to repair the dam. If placed in the break, beaver will spring the trap with mud and debris as they approach to repair the dam. The trap should be placed deep for a hind-foot catch and to avoid nontarget catches. Be certain the trap is firmly embedded and level on the bottom, and attached to a drowning device. Sometimes at these locations, castor trench sets using snares, body-grip, or foot-hold traps can be placed nearby to catch beaver as they approach the break in the dam.

Trapping in ponds and watershed structures

Landowners often detect beaver activity in farm ponds or watershed structures soon after the animals move into the pond. If the beaver cause damage and nonlethal options do not work, the beaver should be trapped and removed as soon as possible. Ponds usually are first colonized by a 2-year-old pair or, less often, a solitary beaver. If the 2-year-old pair is allowed to remain until the second spring after their arrival, they will produce a litter of young and the problem is compounded.

One method of trapping beaver in small ponds is to set body-grip traps in the underwater entrances to the active dens. However, it is sometimes difficult to locate the bank dens, and they sometimes may be so deep that is difficult to set the traps.

Beaver can readily be trapped or snared at the castor trenches at strategic locations around the pond without having to set the bank dens. Good locations are near fresh feeding areas, beaver castor mounds or any place beaver show signs of activity along the bank.

Another possible location would be near the spillway or drain tube. If beaver have been persistent in maintaining a dam at the spillway or in plugging the drain tube, a break should be made in the dam. A castor trench set using a snare, body-grip or foot-hold trap can be set nearby. Occasionally, a foot-hold trap can be used at a break in the dam at the spillway or at the torn out plug in the tube. Also, a body-grip trap or snare sometimes can be used in front of a break if a channel is present or can be constructed.

Castor trenches using snares or body-grip traps set at prime locations around the pond usually will take most or all of the adult beaver. If a pair of beaver are judged to be the only occupants of the pond, four castor trench sets at good locations often will take both beaver the first night. It is best not to have snares too close to each other because a beaver struggling in a snare may alarm the mate, causing it to avoid the other sets in the area.

Sometimes a combination of body-grip traps at active lodges or bank dens, as well as at castor trenches at locations around the pond, will be needed if several beaver are in the colony.

Snares at the castor trenches are not as effective in the late summer because the year's young will go through a 9-inch loop without being caught. Body-grip traps at castor trenches are effective on young beaver as well as adults.

In larger streams, large lakes or impoundments where several colonies of beaver live, it may be possible to trap out individual colonies. But because of the large expanse of habitat and numbers of beaver, trapping may not be the answer. More beaver may soon replace the beaver caught. Preventive measures may be the best course of action.

TRAPPING AS A BUSINESS VENTURE

Although beaver trapping is not the profitable occupation it once was, there are ways to derive an income from this activity.

Remember, however, it is illegal to use parts of nuisance beaver that are taken when the trapping season is closed.

Nuisance control

Because beaver are plentiful and often cause problems to farmers, as well as urban dwellers, some trappers contract with landowners to trap nuisance beaver. To catch beaver in damage control situations, trappers have to invest considerable money in equipment and spend a lot of time to gain the experience and knowledge to be successful. Because of these skills and costs, qualified trappers charge professional fees. Some contract by the job, and others charge a set fee for each beaver caught. Some also charge a service fee or mileage.

Selling meat

Beaver meat was relished by native Americans and later by explorers and trappers. Today many people still enjoy beaver meat, and trappers can derive extra income from its sale.

It is important to handle beaver that are to be eaten as carefully as any other wild game that is to be consumed. Beaver should be skinned and gutted as soon as possible after they are caught. Markets for beaver meat usually can be found in any sizable town or city in the state.

The carcasses can be frozen until they are sold. Skinned carcasses taken by legal methods on a trapping permit during the trapping season can be sold to individuals for personal use.

Marketing castor glands

Castor glands also can be marketed. All fleshy membranes should be cleaned from the castors when they are taken from the beaver. Castors can then be frozen until the trapper has a sufficient quantity to sell. Castors can then be taken out of the freezer and hung in a warm, dry, airy place. It takes four or five days at 70 degrees F to dry castors to the semi-dry state.

Most quoted prices are for semi-dry castors, but some are purchased "green" or undried at a lesser price. On average it takes about 10 beaver to make a pound of semi-dry castors.

Dealing in pelts

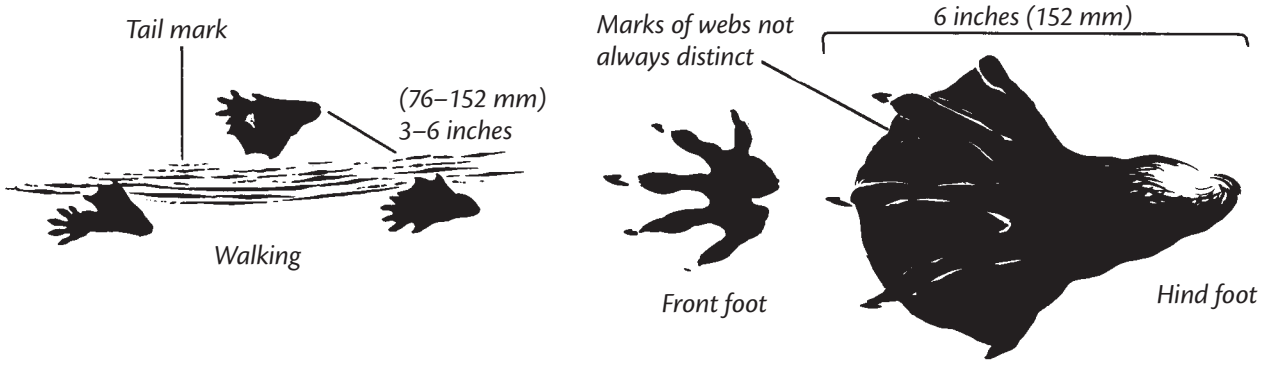
Beaver pelt prices fluctuate from year to year depending on fashion, supply and demand, and harvest. Pelts that are properly skinned, stretched and dried bring more on the market than those that are sold "green" or undried. Some trappers sell unskinned beaver for even less money.

Beaver pelts can be sold locally to a fur buyer or at a fur auction. Some trappers ship furs to auctions in Canada. Some keep their harvest and have coats made for themselves and their family members.

Buyers grade finished beaver pelts for primeness or condition, size, color and damage. The pelt will be graded down for any damage, which is usually in the form of cuts or bites. Color of the pelt may be a factor because lighter colored pale beaver are in the most demand.

Beaver pelts are graded for size by measuring from the nose to the tail, then from one side to the other, and adding the measurement together. Usually, a buyer will quote a price for a basic blanket, which refers to a pelt measuring 65 inches. The next size above blanket beaver is the super blanket. There is a 5-inch spread between sizes so a super blanket beaver pelt would measure 70 inches or more. The next size below the blanket is 60 inches or extra large; 55-inch beaver pelts are called large; 50-inch beaver are medium. Pelts that measure 45 inches are called small, and under 45 are classified as kits.

Beaver tracks



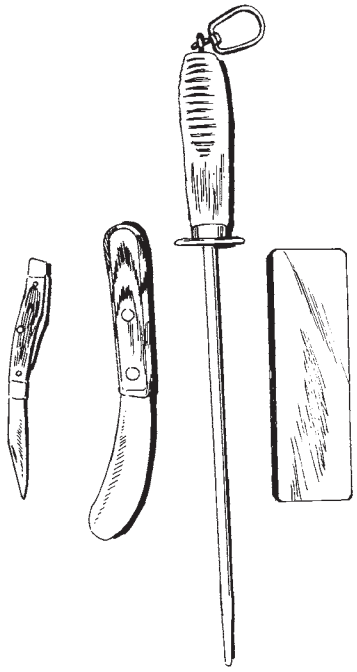
Charles W. Schwartz art is courtesy of the State Historical Society of Missouri, Columbia.

To make the best use of a beaver, it needs to be handled properly from the time it is caught to the time the fur is sold.

Skinning

To get the best price for beaver fur, take the time to properly care for the pelts. The first step begins when the beaver is taken from the trap. The beaver should be washed at the trapping site to remove any mud or sand and kept clean while being transported to where it will be skinned. If the fur is still wet, rub it down with a soft cloth or paper towels to remove most of the water, then hang it in a warm place in front of a fan until it dries. Many trappers prefer to skin a beaver while it is still damp and then dry the pelts later.

Snow can be used to dry a beaver by rubbing it into the wet fur. Avoid laying a wet freshly caught beaver on the ice as the wet fur will freeze to the icy surface.



The beaver's tough skin will quickly dull a pocket knife and curved beaver knife. Keep them sharp with the frequent use of a butcher's steel and a sharpening stone.

The proper equipment will make handling the fur more efficient. Knives are the most important component. A pocket knife can be used for the initial cuts, but a curved beaver knife, available from dealers who sell trapping supplies, is best for the actual skinning process. Because beaver skin is tough, a sharpening stone and a butcher's steel will help keep the knife sharp.

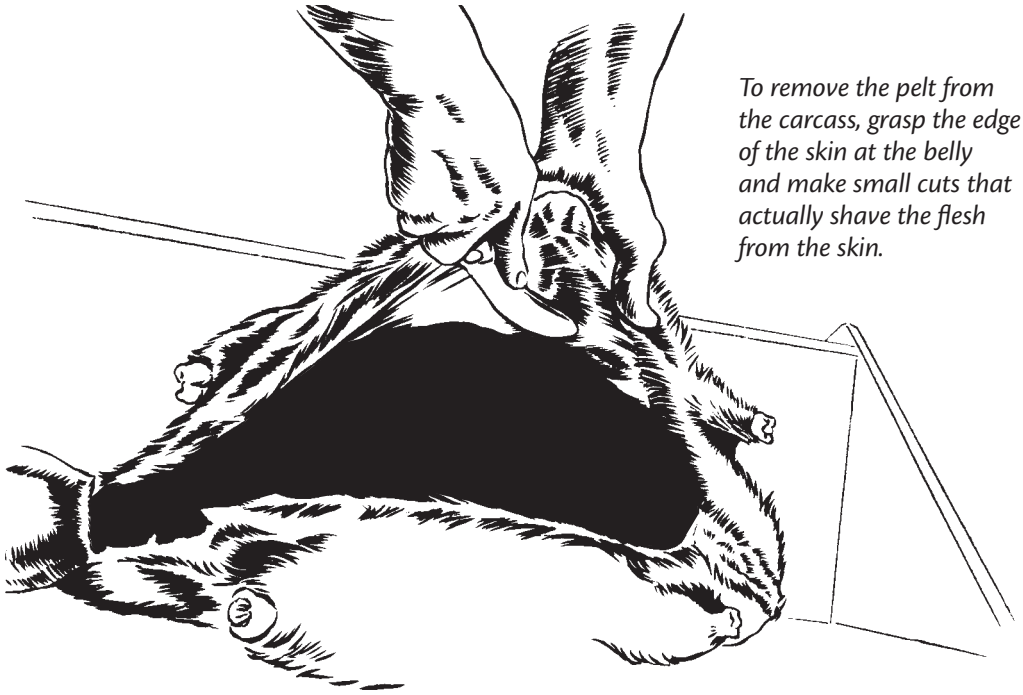
A trough will make the skinning process easier. To build one, take two 1-inch boards that are 12 inches wide and 36 inches long. Nail them together at a 90 degree angle to form a "V." Two other 1-inch boards that are 12 inches wide and 16 to 18 inches long should be nailed to each end so that when the beaver is placed in the "V," the trough will be stable. Position the beaver belly up in the trough. Paper towels or clean rags are handy for wiping up the blood and grease, and surgical gloves will protect the hands and keep them clean. Choosing a warm, well lighted place to skin will make the job go much quicker and easier.

There are two methods of skinning beaver. The rough-skinned method involves leaving a large amount of flesh and fat on the pelt, which must be removed later before the beaver pelt can be properly dried. While initially faster, this method requires additional time later to flesh or scrape the pelt. The clean-skinned method, where the trapper cuts away all the fat and meat at the time of skinning, requires more time, patience and skill and is the method preferred by most beaver skinners.

Regardless of the method chosen, begin with a sharp pocket knife and make a cut through the skin completely around each foot at the joint. All four feet then can be disjointed and removed. Make a cut around the tail at the fur line. Next make the main opening cut from the lower jaw down the belly to the base of the tail, being careful not to cut into the intestinal cavity. It is important to make this cut straight so the beaver pelt will not be out of shape when the skinning process is completed.

A homemade trough will help hold the beaver in place and make the skinning process go more smoothly.

To do the clean-skinned method, make sure the beaver knife is razor sharp. Grasp the edge of the skin at the belly and make small cuts that actually shave the flesh from the skin. After these initial cuts have been made, grasp the skin tightly in one hand and



To remove the pelt from the carcass, grasp the edge of the skin at the belly and make small cuts that actually shave the flesh from the skin.

To skin a beaver, it is best to work evenly back and forth along the carcass, repositioning the animal in the trough as necessary.

hold the knife at an angle to cut close to the skin.

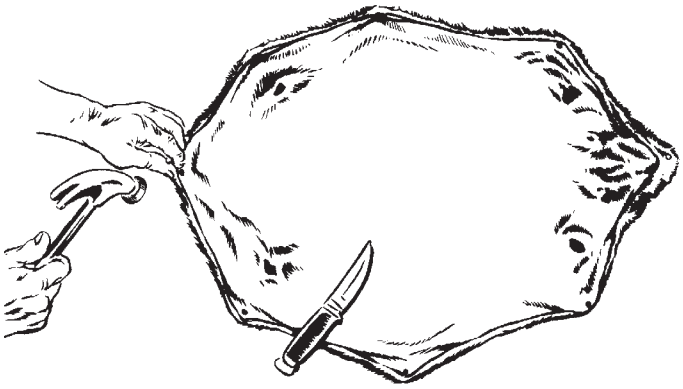
Continue holding the skin tightly and carefully stroke the knife against the skin leaving a minimum amount of flesh on the pelt.

To avoid cutting the skin, keep a tight hold on the skin and keep the knife at an angle close to it.

It is important that the knife is kept sharp by frequent whetting on the butcher's steel. If the knife becomes too dull, hone it on the sharpening stone, then whet it on the butcher's steel to finish the edge. Without the whetting on the steel, the edge of the knife may become slightly rolled and will not work properly.

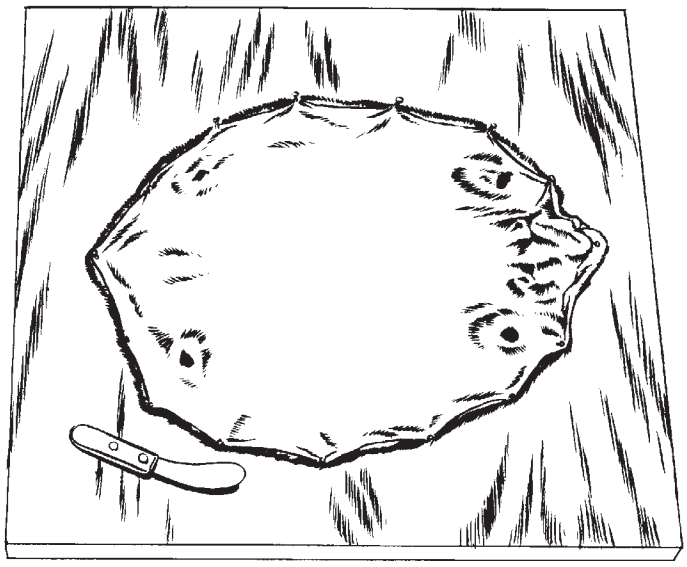
It is best to work evenly back and forth along the beaver, repositioning the animal in the trough as necessary. It takes a lot of patience at first to develop the skill to skin a beaver, especially if the clean-skinned method is used. The more difficult areas to skin are around the legs, tail and shoulders.

Drying the pelt



Step 1:

To help achieve an oval-shaped skin, drive the first nail through the nose, then pull the pelt on one side, then the other, nailing as you go. End with the last nail in the tail area.



Step 2:

If the pelt isn't oval at this stage, change the location of the nails to correct the shape. Use a dull, rounded, large knife blade to scrape off all the fat around the edge of the pelt before adding more nails.

Once the beaver is skinned to the middle of the back, it will have been repositioned several times and will be laying on its side. Now turn the beaver end for end and continue the process on the other side. If the beaver was clean skinned, it should be nearly free of flesh and fat. If rough skinned, a layer of fat and flesh will have to be fleshed off later.

After the beaver is skinned, the castor glands and oil sacs can be removed. Oil sacs should be freed of any membrane and flesh, and frozen to sell or use later for lure. Some trappers prefer to puncture the end of the sacs and drain the oil into a jar for storage.

After the castors are removed and cleaned of excess flesh, they can be dried or frozen for later use.

Processing the meat

If the beaver carcass is going to be used for human consumption, it should be hung up by the tail for final dressing after the castors and oil sacs are removed. Then remove the head. Next, make an incision along the belly from the base of the tail up to the throat region so all the intestines can be removed.

It is a good idea to cut away and discard the flesh around the area where the castor glands and oil sacs were located. If necessary, the beaver carcass can be washed with clean water and allowed to drain for a few minutes.

Finally, slip a bag over the hanging carcass, remove the tail, if desired, and place the bag in the freezer, or prepare the beaver at once for the table.

Fleshing the skin

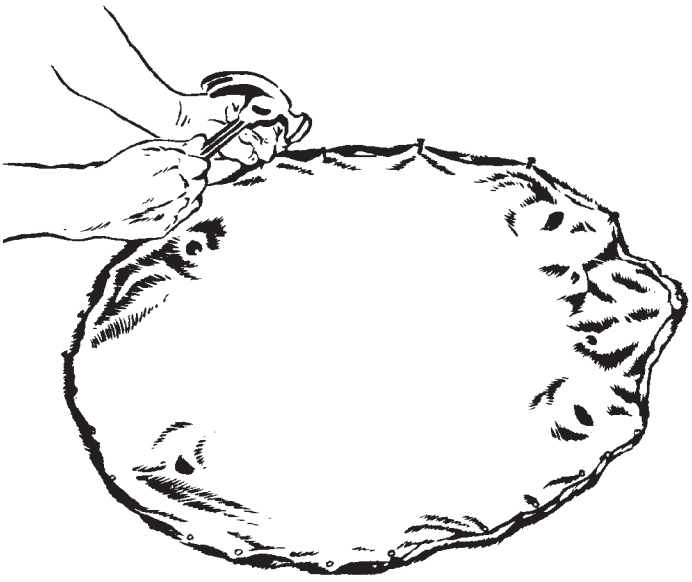
If the beaver has been rough skinned, fleshing the pelt is necessary. A fleshing beam and a fleshing knife are used to scrape away the excess flesh and fat. The best way to learn this difficult process is to visit a fur buyer who does fur processing and get a hands-on demonstration.

If the beaver has been clean skinned, the small amount of fat or flesh remaining on the pelt can be removed after the pelt has been nailed on the drying board.

Drying the pelt

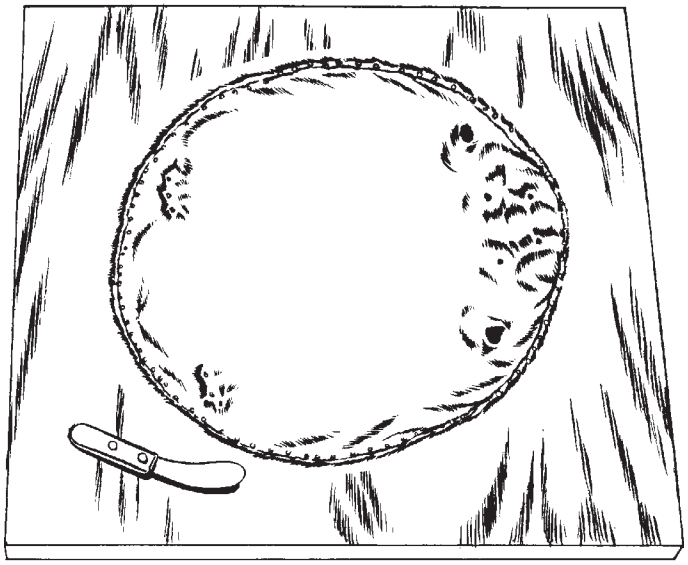
To dry beaver pelts, the early day mountain men and native Americans used rawhide to lace the pelts on hoops made of saplings. Modern day trappers sometimes use nylon cord with metal or fiberglass hoops. The most common modern method of drying a beaver pelt, however, is to nail the pelt on a 4 foot by 4 foot sheet of 3/4 inch plywood.

The first step is to make sure the fur is clean and dry. Remove all mud and dirt. If the pelt is wet or damp, fold it in half so that no flesh is exposed. Place the pelt in a warm place and dry it with a hair dryer or a window fan. Do not expose the undried pelt to excessively warm temperatures while drying.



Step 3:

Continue adding nails until the skin is oval shaped and the nails are about 1 inch apart.



Step 4:

The last step before drying is to scrape all excess flesh and fat off the pelt, especially around the legs and head.

Sew up all holes or cuts before the pelt is nailed to the plywood. Use a curved veterinarian's needle and waxed dental floss for thread, and work on the flesh side of the pelt.

Stretching is the term used for nailing the pelt to the plywood. Actually the term is a misnomer. The pelt should be pulled to its maximum size, but not stretched. Stretching would cause the pelt to be distorted and the fur to be thinner, and would reduce the value of the pelt.

A hammer and a quantity of six or eight penny nails are used to attach the pelt to the plywood once the fur is dry. Start the process by placing the pelt on the plywood, fur side down, with the beaver's nose near the top of the board.

Drive a nail through the nose to secure the pelt to the board. The finished pelt should be oval shaped—a little longer than it is wide.

With this in mind, and without pulling the pelt tight, pull out on each side of the pelt in the area of the front legs and put a nail at the edge of the pelt on each side. Next pull the pelt out in the middle area, and put a nail on each side. Now do the same thing in the area of the hind legs. The last nail goes in the tail.

By now the pelt should be in a rough oval. At one time, fur buyers wanted the pelts shaped perfectly round, but in recent years the oval shape is preferred. If the pelt measures 35 inches long from nose to tail, it should be about 30 inches wide. If a little off, it doesn't matter. Just change the location of the nails to correct the shape of the pelt.

Now is the time to clean the edges of the pelt where the rest of the nails will be placed. A dull, rounded, large knife blade works well for this. Scrape off all fat around the edge of the pelt. Trim the points near the lower jaw and tail. Next, pull the edge of the pelt out between each nail and add a nail all the way around. Add the nails in a curved line to keep the oval shape. Continue the process until nails are about 1 inch apart.

On a cleaned-skinned pelt there should be a minimum of flesh that needs to be scraped off with the dull knife blade. Scrape all excess flesh and fat off the pelt, especially around the legs and head, where it may be more difficult to remove. Wipe all excess grease off the pelt and carefully nail the hind leg holes shut. If desired, the front legs can be nailed shut or tied off with dental floss or twine.

The next step is to finish drying the pelt. Do not use excessive heat. A window fan blowing in a warm, dry room at about 70 degrees F will take seven days or so to dry a pelt, provided the pelt was fleshed properly, and the fur was dry when the pelt was nailed on the plywood board. Once the nose has dried completely, the rest of the pelt should be dry.

Once dry, the pelt can be taken off the plywood board. Dried pelts should be stored in a cool, dry place away from mice or insects. If several pelts are to be stacked together, place them fur to fur and flesh to flesh.

MISSOURI DEPARTMENT OF CONSERVATION OFFICES

Regional office staff are ready to answer your questions and provide you with information about the resources, programs and opportunities in your part of Missouri.

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